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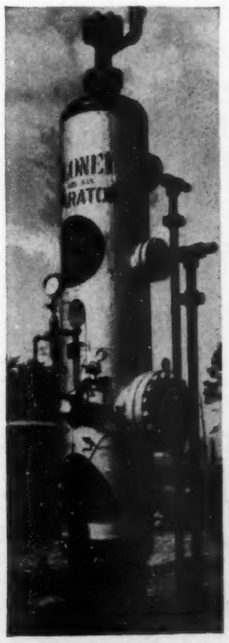

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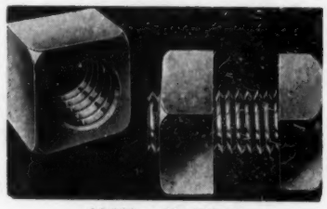

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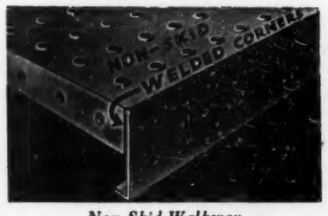

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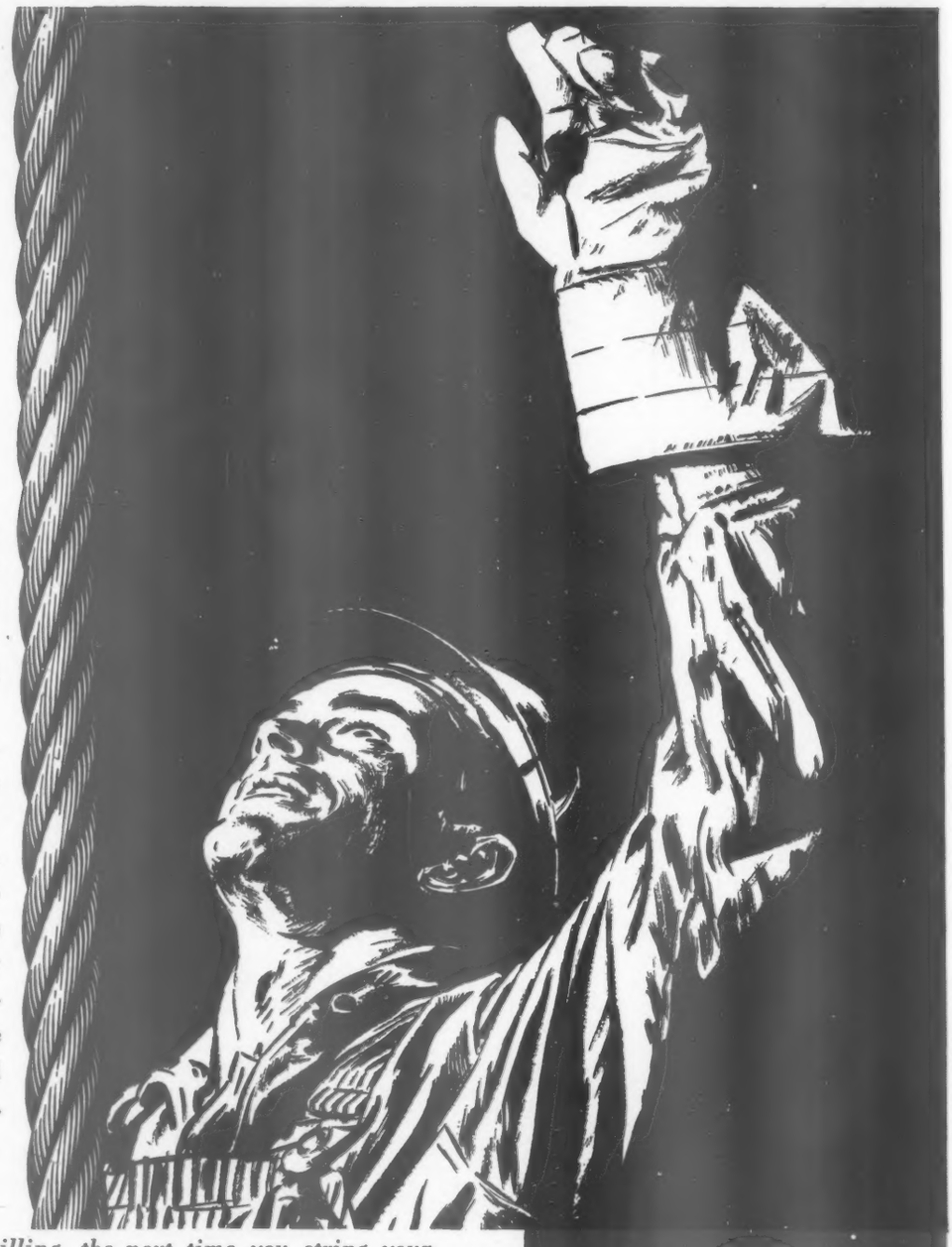

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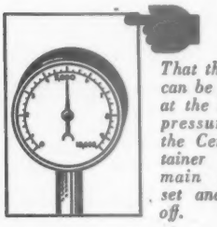
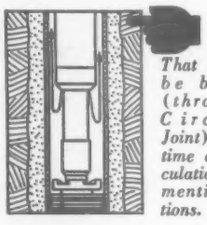
YOU DON'T HAVE TO KEEP YOUR FINGERS CROSSED When Doing a Squeeze Job with a

BAKER CEMENT RETAINER

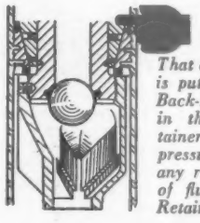
When you're doing an important squeeze job, it's a mighty good feeling to know that the tool you ran in the hole will do its work and do it properly. That's why superintendents who have the responsibility of seeing that squeeze cement jobs turn out successfully like to run Baker Cement Retainers. When a Baker Cement Retainer is on the job, they are sure of three important things:



That the cement can be put away at the necessary pressures, and the Cement Retainer will remain securely set and packed off.



That fluid can be bled off (through the Circulation Joint) at any time during circulation or cementing operations.



That after the cement is put away, the Ball Back-Pressure Valve in the Cement Retainer will hold the pressure and prevent any return movement of fluid through the Retainer.

NOT AN EXPERIMENTAL TOOL

It is important to realize that the Baker Cement Retainer is in no sense an experimental tool . . . it has been used successfully in thousands of oil wells in fields throughout the world. The original Baker Cement Retainer was invented (and the name "Cement Retainer" originally coined) some 30 years ago, and the present tool embodies the knowledge and experience gained during that time in both manufacturing and running many Cement Retainers.

It is in this accumulation of skill and experience that goes with every Baker Cement Retainer run into the hole today, and is the reason why . . . *you don't have to keep your fingers crossed when a Baker Cement Retainer is doing your squeeze job.*

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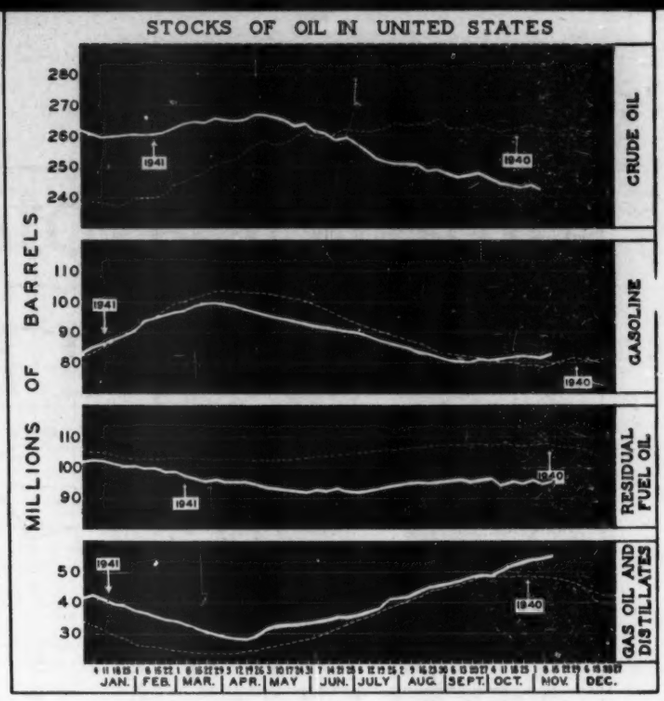
BAKER CEMENT RETAINER

Trends

Output Now Keeping Pace With Enlarged Demands of Buyers



ECONOMISTS and market observers are calling attention to current statistical reports which show that producers and refiners have expanded their operations to the point where they have caught up with demands and in some cases may have to make adjustments in their operations over the remainder of the year to prevent the accumulation of excess supplies. The outstanding situation pertains to products classed as distillate and gas oil applying to East Coast and Gulf Coast operations. During the tanker-shortage period of last summer and early fall, refiners and marketers were confident the eastern part of the United States was faced with a shortage of intermediate oils which are largely used as fuels. Every effort was made to prevent this development and inventory data show operators have been successful. Stocks of these products at East Coast refineries and terminals are greater than they were a year ago and there are also excess supplies at Gulf Coast points. Price trends over the past 2 weeks at the two refinery centers have reflected this situation. The fact that the coastwise transportation situation is becoming more normal due to a return of tankers and that consumption has been delayed by warm weather in the East has contributed to the inventory accumulations.

The return of tankers is having a bearing on Illinois basin operations and to a lesser extent Mid-Continent operations are affected. Tank-car shipments of crude oil and products are decreasing between Illinois and Atlantic seaboard points and if sufficient tankers are made available it is expected that this costly movement will dry up completely. This development means increased outlets for Texas and Louisiana but a reduced demand for Illinois output. Spot crude last week was reported to be more freely available in Illinois than any time this year.

Generally crude-oil production this month has been running ahead of the B. of M. estimate of demands and the inventory curve has flattened out after a steady decline starting last April. Gasoline stocks are greater than last year and the trend in heavy fuel-oil inventories has been upward in recent weeks. Many feel that increases in above-ground stocks in preparation for next year are desirable but others, aware of the unhealthy stock trends that have often developed in the past at this time of the year resulting in unwanted market softness, feel that present inventories are sufficient for this season of the year. They recommend that producers keep their output in line with the Government's estimated demands and refiners make whatever adjustments are necessary to maintain their inventories within working requirements.

CRUDE PRODUCTION *4,112,885 bbl. daily average—up 13,480 bbl. One year ago 3,571,865 bbl.*

CRUDE STOCKS *241,829,000 bbl. as of November 8—down 1,511,000 bbl. One year ago 261,931,000 bbl.*

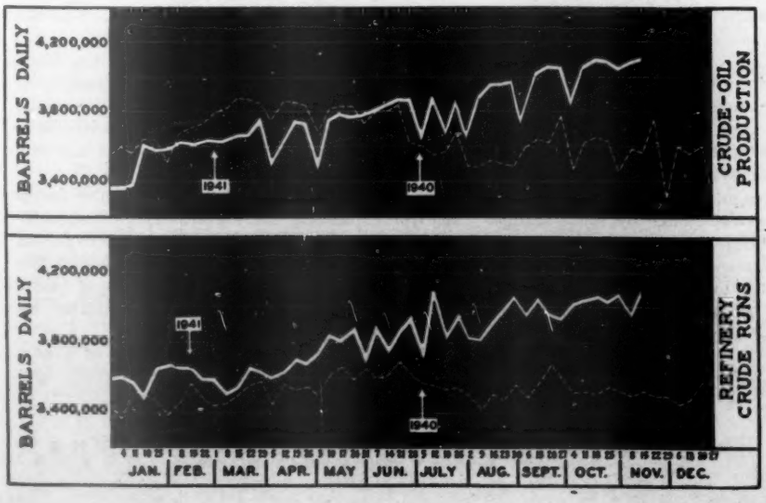
GASOLINE STOCKS **83,412,000 bbl. as of November 8—up 635,000 bbl. One year ago 79,340,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *95,993,000 bbl. as of November 8—up 178,000 bbl. One year ago 105,909,000 bbl.*

GAS OIL AND DISTILLATES *54,983,000 bbl. as of November 8—up 340,000 bbl. One year ago 47,911,000 bbl.*

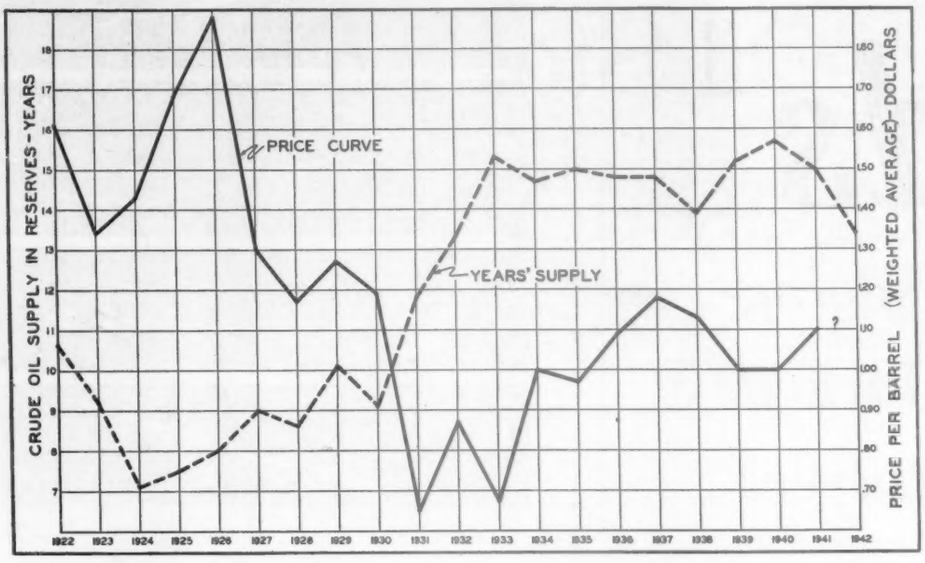
REFINERY RUNS *4,010,000 bbl. daily week ended November 8—up 65,000 bbl. One year ago 3,540,000 bbl.*

*Includes 7,307,000 bbl. aviation motor fuel, up 179,000 bbl. One year ago 6,264,000 bbl.



DAILY AVERAGE PRODUCTION FOR WEEK

	Nov. 15, 1941	Bur. Mines Nov. est. of demand	November state allowables	Nov. 8, 1941
Arkansas	72,780	76,500	73,653	72,440
California	663,750	626,700	613,200	654,805
Eastern fields	113,950	114,800	.....	113,850
Illinois	390,270	408,100	..	415,755
Kansas	255,550	253,500	257,000	238,950
Louisiana	358,770	333,200	347,058	348,295
North Louisiana	*82,120*	.....	.....	*82,445*
Louisiana Gulf Coast	*269,650*	.....	.....	*265,850*
Michigan	61,310	47,400	57,550	62,840
Mississippi	76,255	55,100	.....	64,150
Nebraska	6,760	6,200	.....	6,850
New Mexico	116,400	115,200	116,500	116,410
Oklahoma	427,650	469,400	428,000	421,750
Rocky Mountain states	109,240	109,200	.....	110,310
Texas	1,460,200	1,454,700	1,533,282	1,473,000
East Texas	*369,650*	.....	.....	*369,650*
West Texas	*285,600*	.....	.....	*286,800*
North Central Texas	*137,300*	.....	.....	*137,150*
East Central Texas	*83,050*	.....	.....	*87,250*
Texas Panhandle	*79,600*	.....	.....	*79,800*
Texas Gulf Coast	*410,800*	.....	.....	*416,600*
Southwest Texas	*94,200*	.....	.....	*95,750*
Total United States	4,112,885	4,070,000	.....	4,099,405
Total production, Jan. 1-Nov. 15, 1941		1,206,954,750 bbl.		
Same period last year		1,179,391,485 bbl.		


CRUDE OIL SUPPLY IN RESERVES - YEARS
PRICE PER BARREL (WEIGHTED AVERAGE) - DOLLARS
PRICE CURVE
YEARS' SUPPLY
?
1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942

Price of crude charted against years' supply of crude reserves. The reserve curve is adjusted for years in which no authoritative estimates were available

Government advocacy of expansion of the exploratory program in the oil industry is intimately associated with crude-oil prices, shows the record of past years. Recent acquiescence of North Texas purchasers to an order from the OPA to rescind the upward adjustment of posting presents a set of conflicting issues that are receiving broad discussion in the industry. Some of the basic factors figuring in these discussions are outlined in the accompanying article.

By H. STANLEY NORMAN

Reserve Needs Indicate Price Advance Quickest Solution

PRODUCERS of crude oil either must have a price advance or an equally effective substitute if the Government's vision of a substantial increase in petroleum reserves is to be realized. This axiomatic conclusion, long recognized in the industry as an almost infallible rule, becomes particularly significant in view of the opposition to rises in petroleum markets displayed on enough occasions to become an accepted policy of the Office of Price Administration.

Purchasers in North Texas last week obeyed instructions from Leon Henderson, director of OPA, and rescinded the upward adjustment there of 7 cents per barrel. The higher adjusted prices were in effect from 5 to 7 days. All buyers who met the original adjustment by Sinclair Prairie Oil Marketing Co. have accepted the OPA order on North Texas crude prices and are again paying the former scale topped by $1.18 per barrel for 40-gravity oil.

OPA's interference in the crude market has broader significance than the mere nullification of one of the means by which competitive elements in the industry have always jockeyed for position. The North Texas adjustment simply was another expression from one element in the industry that it needed more crude of a certain type and was willing to pay a higher price in order to satisfy that requirement. Other purchasers, anxious to hold their losses of connections to a minimum, were compelled to advance their postings by similar amounts.

The North Texas price action, local in many aspects, may have been, however, among the first dim reflections of a much broader and, from the view of the Offices of Petroleum Coordinator, a much more important general fundamental relationship. From the time that producible petroleum reserves became a concern of the oil industry, governments and the public, there has been a reasonably close general relationship between the volume of underground storage and the posted price for crude. Failure of the relationship to be even more exact is because of contributing factors that vary in their pressure on prices and reserves in proportion to the immediate influences exerted at any one time.

The accompanying chart shows an adjusted curve of years' supply of underground producible crude-oil reserves plotted against weighted average annual prices of oil since 1922. Although earlier relationship between the two curves is significant in judging the present and future by the past, the relatively sharp descent of the years' supply this year and in 1942 is the portion most pertinent to current discussions in the industry.

Years' Supply Curve Down

On the basis of this year's accelerated rate of production in consort with discoveries that will no more than equal those of a year ago, the curve of years' supply is pushed to the lowest point obtaining since discovery of East Texas. The most glaring anomaly of a steep climb of years' supply of crude reserves and low prices prevailing from 1930 through 1933 is caused chiefly by the constant upward revision of East Texas which was not recognized as a 4 billion barrel field until 1933 and even later by some authorities. Meanwhile, however, prices of oil reacted not only to the influence of this sharp addition to reserves but also to depressed conditions in general business. Then too, reserves added by drilling East Texas were obtained on a low-cost basis.

Rising prices from 1935 through 1937 without concomitant bulges in the years' supply of reserves indicate that the price incentive was insufficient stimulation to overcome the combination of steep increases in production and, some believe, the growing time factor related to discovery. Contrary to most previous years, the decline of years' supply in 1938 did not lift the price curve but here again extraneous influences overcame normal relationships within the industry.

Revisions that are made in appraisal of reserves from year to year have a tendency to distort slightly relationships between producible supply and crude prices. This probably explains the rise of years' supply in 1939 and 1940 against a price curve that was downward or level from 1937 through 1940. The reduction in years' supply at the start of 1941 appears to have again exerted a normal relationship on prices.

Reserves at the start of next year, while not yet available in detail, will probably be around 13.5 years' supply on the basis of 1941 production, compared to a reserve of 15 years at the start of this year.

Disclosure was made in Washington last week that the Office of Petroleum Coordinator is in final stages of surveying the cost of producing oil. Secretary Ickes, the coordinator, said at a press conference, however, that he was not prepared to reveal conclusions.

In view of the emphasis placed on the necessity for expanding the exploratory campaign by Deputy Coordinator Ralph K. Davies before recent meetings of trade associations, observers in the industry conclude that the relationship of years' supply and crude prices will be considered by OPC in its market appraisals.

"You and I know that the discovery of a new and important oil field has become a costly and

(Continued on Page 28)

Lubricating-Oil Stock Plentiful Despite Increased Demands

By J. P. O'DONNELL

NEW YORK, Nov. 18.—Despite indications that suggest otherwise, there is little reason to anticipate a shortage of lubricating oil in this country because of the increased industrial and military demands. Among the factors which have given rise to fears of a shortage are these:

1. Continued decline of stocks during the early part of this year.

2. The admittedly tight market for lubricating oils of high quality.

3. Establishment of a price ceiling for Pennsylvania neutrals.

The reduction of stocks of lubricating oils during the 6 months ended July 31 totaled 1,702,000 bbl., approximately 20 per cent of the volume in storage as of January 31. If this rate of reduction were continued it would likely result in a critical shortage eventually. However, it actually brought stocks of all lubricating oils back to a position somewhat comparable to that which existed at the beginning of the war. In doing that it merely corrected for overproduction since then.

The reduction was definitely not a result of inability to produce in quantities equivalent to demand. During those 6 months production averaged 102,500 bbl. per day. This contrasts wtih a peak production of 117,350 bbl. per day in June 1941 and with an indicated minimum capacity for the country as a whole of 132,250 bbl. per day. Had production been maintained at the June average throughout the 181-day period in which stocks were declining, close to 1,000,000 bbl. would have been added to stocks in place of the actual withdrawals. (See Table 1.)

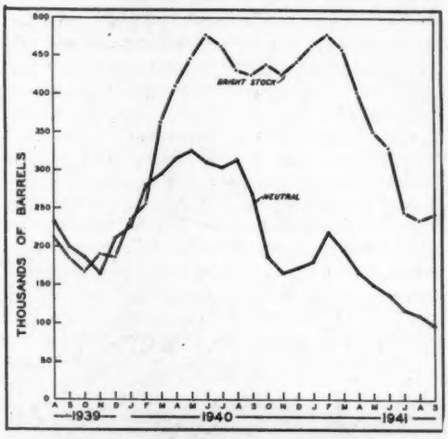
TABLE 1—LUBRICATING OIL PRODUCTION
(June 1941)

Refining district—	Production
East Coast	769,000
Appalachian	565,000
Ind., Ill., Ky.	347,000
Okla., Kans., Mo.	347,000
Texas Inland	25,000
Texas Gulf	850,000
Louisiana Gulf	187,000
Ark., La. Inland	57,000
Rocky Mountain	9,000
California	364,000
United States total	3,520,000
United States total (daily)	117,333
United States total (annual)	42,826,545

There are no figures immediately available on the lubricating-oil-producing capacity of this country. However, in June of this year, production was at the highest rate in the history of the industry. On the basis of the daily average production of that month, the United States could produce 42,830,000 bbl. annually. Demand this year, both foreign and domestic, is expected to approximate 40,700,000 bbl. This will be more than 14 per cent above the previous demand peak but, at the same time, will be fully 5 per cent less than the volume the industry demonstrated it could produce in June.

Possibly an even truer picture of the lubricating-oil-production capacity of the country is given in Table 2. This table gives the peak production rate of the various refining districts during the past 2 years together with the year and month in which each peak was attained. On this basis the United States has a daily average capacity of 132,257 bbl. per day or 48,273,805 bbl. per year. This is 18.6 per cent greater than the indicated 1941 demand and also 9 per cent greater than some estimates of 1942 demand.

The outlook from a quality standpoint, however, is not so secure. Much of the increased demand is for better quality oils. This is especially true of the requirements of the armed forces. Setting a minimum of 95 v.i., for example, would entirely exclude a large portion of the domestic lubricating-oil production. It could be met by oils produced from Pennsylvania crude and from some Oklahoma, North Texas and other Mid-Continent crudes but would eliminate oil from coastal crudes.



Trends of stocks of bright stocks and neutrals, showing extensive draft on inventories this year

This undoubtedly has been a major contributing factor to the tightness of the high-grade lubricating-oil market. Demand, or at least shipments from refineries, for these oils has become so great that some of the major oil companies readily admit that they cannot supply it. Another factor which is believed to have an important effect also is the speculation which invariably accompanies a rising lubricating-oil market. This buying is shown in refinery sales, but it does not reflect actual consumption. Therefore the current tight market may be attributed not only to the known increase in demand but also to the unknown volume held by distributors which is normally not released until a price decline sets in. This buying on a rising market and selling on a falling market accelerates price fluctuations and is in a large measure accountable for the comparative instability of lubricating-oil prices.

TABLE 2—LUBRICATING OIL CAPACITY

Refining district—	Year	Month	Total	Daily average
East Coast	1939	Aug.	866,000	27,935
Appalachian	1939	Oct.	625,000	20,161
Ind., Ill., Ky., etc.	1941	July	399,000	12,871
Okla., Kans., Mo.	1940	Apr.	350,000	11,667
Texas Inland	1941	Apr.	41,000	1,367
Texas Gulf	1941	July	959,000	30,935
Louisiana Gulf	1940	July	236,000	7,613
Ark. and La. Inland	1941	Jan.	79,000	2,548
Rocky Mountain	1941	Feb.	25,000	893
California	1940	Nov.	488,000	16,267
United States total (daily)				132,257
United States total (annual)				48,273,805

If a shortage of high grade lubricating oils for defense needs does develop it could be most easily met by the substitution of lower grade oils for public consumption and the restriction of high grade oils for military uses. This possibility has been mentioned but an apparently sounder approach to such a problem would be a selective use of crude oils. A considerable volume of lubricating oil crude is now run to refineries not equipped with lube plants while, at the same time, some refineries having lube units are unable to obtain all the high lube content crude they want. Changing of crude supply sources would involve transportation difficulties and likewise would result in substantially higher costs but it would make possible a considerable increase in the production of lubricating oils. Since the industry disregarded costs when the East Coast shortage threatened, it can be safely assumed that neither high costs nor transportation problems will be permitted to interfere with the supply of lubricating oils.

Tightness of the high-grade lubricants at present is Pennsylvania neutral on which a price ceiling was set several months ago. Shipments of this material from refineries have been very heavy since the first part of this year. Statistics are not available later than September but if storage withdrawals continue as they have during this period, the stocks remaining on September 31 would be exhausted entirely by the middle of March.

The only solution to the problem of meeting Pennsylvania neutral demand is by increasing production. This is impossible at present since Pennsylvania refineries, not now operating at capacity, are unable to obtain additional crude. This situation has prevented the execution of a plan to resume operations in one shutdown refinery and has also been the principal reason for delaying a substantial expansion program in another. Pennsylvania crude production has averaged about 72,000 bbl. per day this year, substantially short of the reported 90,000-bbl. capacity of the refineries operating on this type of crude. In contrast to the current daily average production is the peak of 86,700 bbl. reached in September 1937. If that rate could be attained and maintained, Pennsylvania lubricating-oil production would be increased 20 per cent. Both producers and refiners insist that the volume of crude production would be increased by higher crude prices which would stimulate drilling. As a result they have applied for a restoration of the advance rescinded in August on orders of the OPACS. A decision by OPA is expected this month.

There has been no substantial increase in the country's lubricating-oil capacity for some time. Under present circumstances, none seems likely. The SPAB has denied priority rating for at least six or seven plants which would have produced low-viscosity-index oils not suitable for aircraft engines. On the other hand it has approved application for the construction of 4 or 5 plants which will produce high-viscosity-index oils. These, however, are still mainly in the engineering stage.

Wage Law, Priorities, Occupy Drilling Contractors' Attention

By HARRY F. SIMONS

DALLAS, Tex., Nov. 18.—Nearly 300 drilling contractors and supply men gathered here last Thursday and Friday to discuss problems facing the drilling industry. The occasion was the first annual meeting of the American Association of Oilwell Drilling Contractors. Interest at the meeting was centered on discussion of the wage-and-hour law, the position of the drilling industry in national defense and the operation of the priorities system.

The meeting also served to outline the future policy and objectives of the organization which is striving for closer association among men engaged in drilling wells, and a better relationship between the contractors and the oil companies for whom they work. An undertone at the meeting showed that the drilling contractors are desirous of an increased price per foot for their work. There was no discussion on this subject, but a mention by Ben McGraw, Crossville, Ill., cable-tool contractor, that cooperation between a group of contractors and oil companies operating in the Illinois territory had resulted in an improved position for drilling firms brought forth cheers from those in attendance.

The statement by Col. Ernest O. Thompson, chairman of the Texas Railroad Commission, advocating a 25-cent-per-barrel increase in the price of crude brought applause from those attending the banquet session.

Colonel Thompson pointed out that discoveries always increased after a boost in the price of oil, and that this, plus a more generous allowable, would result in the development of reserves badly needed at this time. The price increase would also make it possible for stripper wells to keep on operating in the face of higher cost of materials needed for well maintenance. He expressed alarm at the increased abandonment of small wells caused by their becoming unprofitable.

Colonel Thompson pointed out that if Price Administrator Leon Henderson failed to approve a price advance based on increased costs he should find higher prices are needed to stimulate discoveries. He reviewed the present statistical position of the petroleum industry and pointed out that the nation's crude-oil stocks had declined 19,400,000 bbl. despite the fact the daily average production is about 430,345 bbl. over last year. Gasoline stocks have declined 20,220,000 bbl. in the past 18 months, leaving a total supply of 83,343,000 bbl., enough for 45 days. The reduction has taken place in face of an increase of 495,000 bbl. daily in crude processes.

Pointing to statements by men prominent in the national oil picture, which all indicate even further increases in the demands on the petroleum industry, Colonel Thompson indicated he felt that the idle refining capacity and the idle storage capacity should be utilized. The increase in production should be accomplished without waste.

Allen Not Present

The talk prepared by Robert E. Allen, director of production in the Office of Petroleum Coordinator, was read by E. De Golyer, director of conservation for the petroleum coordinator, when the OPC production head found it was impossible to be in Dallas. Mr. Allen's paper pointed out that no results are obtained until the drill actually strikes the oil sand, and that this places a heavy burden on drilling organizations. He said: "We must drill more wells, produce more oil, develop more proven reserves, obey sound conservation principles, do it all quickly and somehow do it with less material, particularly with less steel." He used figures presented by Walter B. Pyron, at the San Francisco A.P.I. meeting, on the relative amounts of steel used in common oil-field items and defense armament equipment.

Mr. Allen then outlined possibilities for increases in reserves, pointing out that most of the surface and larger known subsurface structures had already been tested, but that large quantities of oil remained to be discovered by deeper drilling, searching for stratigraphic traps and the reinterpretation of known geology.

The director of production then launched into a discussion of the oil reserves of the nation and reviewed briefly the recent past history of the oil industry, characterizing the last 10 years as a period of transition. "It seemed that we had a flood of potential overproduction threatening to break loose and drown our economic structure," he said. "Some oil-company executives were convinced that we had a permanent abundance and

Right: Brad Mills, secretary of the American Association of Oilwell Drilling Contractors; Ike W. Taylor, Taylor Drilling Co., Centralia, Ill., and W. I. Lewis, Mount Vernon, Ill., director of the A.A.O.D.C. Below: Joe Zeppa, Delta Drilling Co., Tyler, Tex., and C. J. Paine, F. B. Paine Drilling Co., Dallas, Tex., treasurer of the A.A.O.D.C. Bottom: Frank Smith, assistant counsel for the Petroleum Equipment Suppliers Association, Houston, Tex.; W. L. Childs, Reed Roller Bit Co., Houston, and E. De Golyer, director of conservation for the OPC

overproduction . . . and demanded a moratorium on drilling for a year or two and one wanted no new wells drilled for 5 years.

"The public not unnaturally came to believe that the country had enormous and unlimited stores of oil. We in the industry are responsible for the fact that too large a section of the public was deluded into thinking that most of the oil wells in the United States were partly shut in, awaiting only a call for more oil. Some of the officials in the Office of Production Management not unnaturally developed the same ideas . . . they couldn't understand why the oil industry should ask for steel to drill more wells. I want you to know that this has been a very difficult problem for the Office of Petroleum Coordinator," Mr. Allen said.

Discusses Priorities

Efforts of the oil-field equipment suppliers to obtain a better supply of materials and the present outlook were reviewed by W. L. Childs, Reed Roller Bit Co., who said that the supply companies and machinery manufacturers first became alarmed when orders for material were long overdue before fulfillment. First material affected was nickel steel, which is used in practically all oil-field equipment. The Petroleum Equipment Suppliers Committee was organized and began to strive for a priority rating for material.

Mr. Childs pointed out that there is always a lag period between production of raw materials and the finished product. This lag period increased almost 6 months and impeded the flow of materials. The Petroleum Equipment Suppliers representatives then went to Washington, according to Mr. Childs, and got a promise from the OPM to change the repair order (P-22) and also promise of a blanket order for petroleum, but this latter order has not come through. Mr. Childs reported that a draft of this order has been shown to the equipment manufacturers at the A.P.I. meeting at San Francisco, but it helped the supply companies only a little and the manufacturers not at all. The order did rate the petroleum business as a defense industry, he stated.

When the equipment manufacturers approached the OPM with letters from the heads of the five petroleum districts, they found it difficult to impress that body as the oil companies had boasted too much about their ability to produce oil and had insisted there was no shortage of petroleum, according to Mr. Childs. When the oil companies were told they were going to have to increase production 5 per cent and do it with only 70 per cent of the steel available, the seriousness of the situation became apparent.

Wages and Hours

Gus C. Street, Jr., regional director, wage-hour division, U. S. Department of Labor, Dallas, outlined the general provisions of the Fair Labor Standards Act and pointed out that the drilling industry was concerned mostly with the maximum hours provisions (Section 7) and the "hot goods" clause in Section 15. He stressed the fact that the wage-hour division recognizes employment contracts provided such contracts were entered into in good faith, were mutually understood by both parties and were carried out without subterfuge with the performance coinciding with the purported terms.

The agreement made by the American Association of Oilwell Drilling Contractors with General Fleming, wage-hour administrator, was lauded by Mr. Street for bringing some 10,000 employes of 300 drilling firms under the terms of the law. The agreement was set out in a letter of July 7, 1941, the principal terms being the acknowledgment that the drilling firms came under the law and would henceforth abide by the interpretations set out by the administrator. On the other hand, the wage-hour division agreed to not make investigations before July 15, 1941.

Mr. Street also pointed out that it was not the purpose of the act nor the intent of the administrator's office to harass any employers and offered to aid any one who applies for help in determining whether any specific procedure was permissible under the law.

In the question-and-answer session which followed, Mr. Street said there was no restriction in the law which prevented employers from establishing either new higher or lower wage rates at any time so long as they stayed above the minimum provided by the law. He again stressed the importance of good faith, performance and fact in agreements made between employers and water pumpers, etc., on the number of hours worked. He warned against coercing employes to fill out fictitious time slips. On the question of travel time, Mr. Street said that two different rates of pay could be employed, one for traveling and one for actual work performed.

Where an employe worked for two companies, neither one of which had knowledge of the employment with other company, they would not be liable for overtime. However, in cases where the companies were allied and had reason to have such knowledge, they would be liable, according to Mr. Street. He also pointed out that there were executive and administrative employes who were exempt from the act, and that a regular monthly salary not less than $200 per month was a prime requisite in addition to other factors.

Reviews Organization

At the Thursday afternoon session, presided over by E. B. Rubsamen, Jr., of Trinity Drillers, Inc., J. E. Brantly, president of the association, reviewed the first year of existence following the organization at the Chicago A.P.I. meeting. Objectives were improvement of services, correction of errors in practices, improved practices and equipment, improved oil-company relations, and increased services rendered in the production of oil.

Mr. Brantly pointed out that the efforts of the association in making the agreement with the wage-hour administrator more than justified the organization's existence. The work of the association in opposing the change in the Internal Revenue Department regulations, which would practically abolish the drilling contractor, have also been noteworthy. The action of the Internal Revenue Department was aimed at the abolition of an abuse of the revenue laws and it may be modified so as not to be damaging to the contractors as a result of the association's action.

Also at the afternoon session, B. F. King, Pa-

Left: E. B. Rubsamen, Trinity Drillers, Inc., and Leslie Fain, Fain Drilling Co. Below: Ben McGraw, Crossville, Ill., new vice president for cable-tool drilling for A.A.O.D.C.; A. S. Ritchie, McPherson Drilling Co.; Harry L. Edwards, vice president at large, and E. K. Carey, Carey Drilling Co., McPherson, Kans. Bottom: J. E. Brantly, president, Drilling Exploration Co., and president of the A.A.O.D.C.; E. B. Rubsamen, chairman of Thursday afternoon session, and Gus C. Street, regional director, Wage-Hour Division, U. S. Department of Labor

International News photo

THE FIRST NATIONAL-DEFENSE PIPE LINE IN THE UNITED STATES IS OFFICIALLY OPENED AT SOUTH PORTLAND, ME., WHEN GOV. SUMNER SEWALL (LEFT), OF MAINE, AND A. CLARK BEDFORD, OF THE STANDARD OIL CO. OF NEW JERSEY, TURN THE VALVES WHICH SEND THE OIL FLOWING BETWEEN PORTLAND AND MONTREAL. *SEE STORY ON PAGE 58*

This Week...

Venezuela reported its production for October averaged about 680,000 bbl. daily, a peak for all time. Final report for September shows output averaged 648,726 bbl. daily.

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Tank-car movement of crude oil continues to taper downward. District 1 received 562 cars daily for the week ended November 8, down 22 cars from the previous rate.

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Stocks of all oils on the East Coast are 3,300,000 bbl. higher now than a year ago. Residual fuels and crude are lower, gasoline slightly higher and distillate fuel substantially up. Total inventories are now 65,409,000 bbl., against 62,105,000 bbl. a year ago.

●

Lessees started inserting "if" clauses in regular lease forms to suspend the time element if defense restrictions prevent procurement of materials to fulfill contractural obligations.

●

Industry committees in the OPC are to be given more responsibility and representation broadened under policies now taking form in Washington, D. C. Complaints heard at some of the recent trade-association meetings are responsible.

●

District chairmen of the OPC marketing committees called to meet in Washington, D. C., next Monday and Tuesday. Up for discussion is the metal shortage forcing changes in the practice of packaging oil. Drums are needed immediately for overseas shipments. Two emergency orders were issued by the OPM to speed manufacture of drums.

●

Restrictions were removed on export of low-grade petroleum products from the East Coast, placing refiners and shippers in District 1 on the same basis as other parts of the country. More rigid restrictions were clamped on the Atlantic seaboard during the threatened supply shortage.

●

Col. Ernest O. Thompson, chairman of the Texas Railroad Commission, urged the OPC to implement program of building crude stocks to 306,000,000 bbl. and gasoline to 103,000,000 bbl. Deputy Coordinator Davies asked for no basic change through December to permit completion of study on desirable level of storage.

●

No additional tanker returns by the British are in prospect, Coordinator Ickes revealed. He pronounced the present transportation situation satisfactory.

●

Crude-oil production bobbed up to 4,112,885 bbl. daily, within 5,000 bbl. of the record high of the week ended October 18.

●

Lubbock County, Texas, enters the list of producing counties, the newest addition. Dawson County appears to be next in line for inclusion. Greater activity in prospect over future months for both areas which are on a northeasterly extension of the West Texas play.

●

Proration of shipments of tetraethyl lead to customers instituted by Ethyl Gasoline Corp. SPAB discussed desirability of placing the knock depressant on the critical list. Refiners at Shreveport, La., as they have done in other recent similar meetings, predict a decline in octane value of automobile gasoline. Meanwhile, one big automobile manufacturer announces plans for building engines to consume 100-octane motor fuel when emergency ends.

●

Federal Tender Board No. 1 opens branch office in Wichita, Kans., to investigate conformity with Connally Act.

●

Texas purchasers nominated nearly 50,000 bbl. per day more crude oil in December than in November. Raised the total they want to buy to around 1,900,000 bbl. daily.

●

Deputy Coordinator Davies asked Texas oil regulators to continue proration schedules on an unchanged basis for December, pending completion of an OPC study of the storage and production question as related to the emergency.

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cific Employers Insurance Co., Houston, Tex., talked on the development of insurance and particularly compensation insurance. He explained the procedure followed in establishing the basic or manual rate for each classification of labor.

Chairmen of the various committees which met in the morning reported the results and recommendations of each group. Those reporting for the various committees were: C. W. Denton, Trinity Drilling Co., for the priorities committee; Joe Zeppa, Delta Drilling Co., wage-and-hour committee; A. S. Ritchie, McPherson Drilling Co., taxes committee; W. K. Powell, Drilling & Exploration Co., insurance committee; George P. Livermore, George P. Livermore, Inc., drilling-practices committee; J. A. Chapman, Gray-Wolfe, drilling-equipment committee; W. A. Brown, Jr., J. I. Roberts Drilling Co., safety-engineering committee; H. A. Peterson, Drilling & Exploration Co., accounting committee; C. J. Paine, F. B. Paine Drilling Co., dues committee; Howard Holmes, Two States Drilling Co., public-relations committee, and Ben McGraw, Crossville, Ill., cable-tool-drilling committee.

C. J. Paine, reporting for the dues committee, said that they had been established at $30 for the first rig and $15 for each additional rig, with a maximum of $250.

The Friday morning session was given over to the address by J. E. Brantly, president of the association, and papers by other leaders in the contracting business. Frank E. Stickle, Mabee Oil & Gas Co., Tulsa, presented a paper on "The Contracting Industry, Its Past, Present and Future"; John M. Shimer, Equipment Engineers, Inc., Dallas, Tex., read a paper on "Trends in Drilling Machinery and Equipment"; C. W. DeLancey, Humble Oil & Refining Co., Houston, Tex., gave a paper on "Drilling Practices"; H. A. Pickens, C.P.A., McCammon, Morris & Pickens, Fort Worth, Tex., read a paper on "Accounting Practices," and Harry L. Edwards, Harry L. Edwards Drilling Co., Houston, talked on "The Contracting Personnel."

C. J. Paine presided at the afternoon session, which included papers by Joe Zeppa, Delta Drilling Co., on "Cooperation Within the Industry," and R. C. Ledbetter, manager safety department, Texas Employers Insurance Co., on "Hidden Dollars in Accident Costs."

Mr. Ledbetter showed that for each dollar in direct costs there were 4 dollars lost in indirect costs. For the 701 serious accidents occurring between 1935 and 1939, the direct charges were $2,258,000, while the 11,144 less serious accidents cost $2,294,000. The medical fees amounted to $1,315,000, bringing the total direct costs to $5,867,000, while an additional $23,468,000 was paid out in indirect costs. During that period, drilling crews in Texas received $121,500,000. The figures are not out of date as one company's costs for the last year agreed with these figures.

Mr. Zeppa remarked in his paper that the drilling contractor was probably the most rugged of rugged individualists and suggested that the time had come to cooperate if progress in the business was to be maintained. He urged the adoption of a program of standard systems of accounting, standard forms for drilling contracts, investigation of wages, hours, and working conditions prevailing in various areas, investigation of transportation costs and the accumulation and distribution of general information affecting the drilling business. He suggested that the willingness to rent drilling equipment when it was idle would serve the two-fold purpose of keeping the available machinery in operation and would prevent the purchase of unnecessary rigs which would later have a depressing effect on the contract price when they became idle.

Officers of the association were reelected with one exception. J. E. Brantly was continued another year as president along with Harry L. Edwards, vice president at large; Warren S. Churchhill, Arrow Drilling Co., Tulsa, vice president for rotary drilling; C. J. Paine, treasurer, and Brad Mills, secretary. Ben McGraw, Crossville, Ill., dilling contractor, was selected to replace John J. Klise, Kemrow Co., Wooster, Ohio, as vice president for cable-tool drilling.

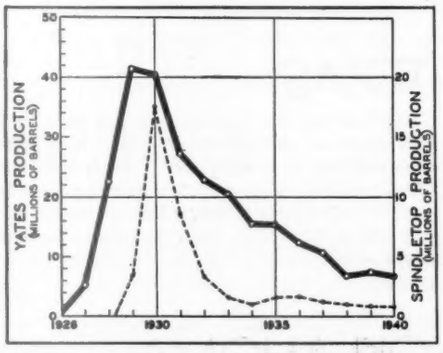
Yates, Birthplace of Proration, Has Fifteenth Anniversary

By ROBERT INGRAM

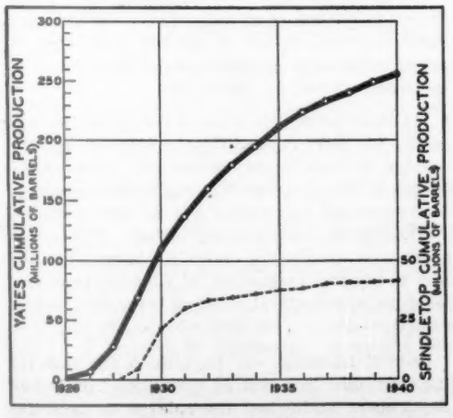
THE Yates oil field of Pecos County, West Texas, was hailed last week on the fifteenth anniversary of its discovery as the birthplace of modern proration. It also remained, in the words of Theo A. Morgan, oil conservation director of the Kansas Corporation Commission, the country's "outstanding monument to true conservation." Its production record, under the first complete and fully comprehensive proration formula, was remarkable.

Proration in one form or another is as old as the oil business, had been applied through price control, pipe-line control, voluntary agreement and legislation. It took many years of trial and error, however, to evolve a formula which would be reasonably equitable to all parties concerned and at the same time permit a rate of production which would approach very nearly the optimum—that is, the rate which in the long run would produce the greatest possible amount of oil from the reservoir.

Soon after the Yates pool was opened in 1926, the 15 companies holding acreage control worked out a plan for production and conservation. It took nearly 3 years to agree on a formula. When it was finally put into effect, however, it become the pattern for orderly development of many an oil field and for many a state regulatory body and today remains, probably, the best example of the application of good proration to a complex situation.



Controlled production from the Yates limestone reservoir, shown here by the heavy line, is contrasted with the decline curve of Spindletop from 1901 to 1916 as shown by the light line



Cumulative production from the Yates limestone reservoir (heavy line) continues a steady rise while the light line showing cumulative production at Spindletop from 1901 to 1916 almost leveled off after a few years

Basically, the formula was similar to that belatedly effected in the Hendricks pool, Winkler County, Texas. Important variations, however, were that the Yates pool potential for the limestone reservoir was taken as the total potential of 100-acre unit averages rather than the total well potential and an arbitrary top allowable for the pool was fixed recognizing the importance of market demand. The first innovation at once removed the premium on dense drilling and encouraged the 40-acre spacing program which was followed. The second was a recognition of an important economic factor of proration.

There were other important provisions of the plan. No well was to be drilled more than 285 ft. into the lime, thus preventing the drilling of edge wells into water, and no wells were to be shot without approval of the engineers. Actually, only 36 wells in the pool have been shot, only 89 treated with acid.

Effectiveness of the Yates program, even considering that the Yates field was one of the most permeable ever opened, is evident in the field's production record (see cuts). More than 257 million barrels had been produced from the limestone reservoir up to July 1941, and engineers estimate there are still some 700 million barrels to be recovered. The yield to date averaged 461,495 bbl. per well and 12,853 bbl. per acre for the 22,000-add acres covering the pool.

Furthermore, all but 38 of the total 557 producing wells are still flowing, the majority of them without stimulation. The rate of pressure decline (1.4 lb. per sq. in. in the first 6 months of 1941) indicated another 15 years of flowing life ahead. (Pressure had dropped from an initial 700 lb. per sq. in. to 529 lb. per sq. in., would be enough to flow wells until it reached 350 lb. per sq. in.)

That the formula had been "good business" as well as good engineering was obvious from the production record shown in the graphs. The heavy line, which merely traces the actual record of production at Yates, is no decline curve although it closely resembles one. It is contrasted with the decline curve—production during the first 15 years at Spindletop on the Texas Gulf Coast.

The contrast shows at a glance the economic value of controlled production. The Spindletop curve, drawn on a different scale than Yates, shows extreme profits in the first 2 years of development, then a precipitious drop. The Yates record, on the other hand, rises almost as quickly to a peak, but that peak is held down and remains almost level for 2 years, then was gradually reduced with an eye to conserving future production as well as for greater and cheaper recovery in the long run. Today, after 15 years, Yates is still producing an allowable of 21,984 bbl. a day, is a long way from a stripper area.

The cumulative production graph shows Yates (heavy line) still rising steadily while the cumulative curve of Spindletop (thin line) after 4 years of flush recovery almost flattened out. Here again the Spindletop curve is drawn to a different scale than that for Yates, but the contrast by this exaggerated scale is even more significant. Particular tribute is due to Yates operators in view of the fact that the field had the United States' greatest gusher, a 204,672-bbl.-a-day initial potential from Ohio Oil Co. 30-A Yates, a tempting quick fortune for any operator and nearly three times as much oil as the entire field was ever permitted to produce in 1 day.

Stanolind Expands Holdings In Texas Oil Properties

ANOTHER purchase of important Texas producing properties by Stanolind Oil & Gas Co., Tulsa, producing subsidiary of the Standard Oil Co. (Indiana), was announced last week. Dr. J. C. Karcher, president of the Coronado Corp., Dallas, Tex., announced that Stanolind had purchased all capital stock of Coronado. Terms were accepted several weeks ago, contingent on checking.

Reports were current in Fort Worth, Tex., that Stanolind was negotiating for a half interest and operating control in the West Texas and Lea County, New Mexico, producing properties of the Landreth Production Corp. It was understood that negotiations with Landreth had been dropped late in the week. A check of Landreth properties in the North Cowden, Goldsmith, and Penwell pools of Ector County, the Taylor-Link pool of Pecos County, and in Ward County, Texas, and Lea County, New Mexico, had already been made.

In midsummer, Stanolind purchased an estimated 3,500 bbl. of daily production of the Barnsdall Oil Co. in the Permian Basin of West Texas, and shortly before that had acquired the discovery well and more than 3,000 acres from Ed Taubert, Jesse McKee, and C. J. Seimonelt of Fort Worth in the Abell Ordovician pool of northern Pecos County, Texas. Later it added more acreage in the area, bought other protection in southwestern Crane County and was a buyer in the Shipley Silurian area of Ward County.

Other purchases this year included half interest in the holdings of M. J. Delaney of Dallas in the North Cowden pool of Ector County, producing properties of L. C. Harrison and associates in the Slaughter pool of southwestern Hockley County, and some undeveloped but considered proven acreage in the same area.

Coronado was founded in 1930 and owned properties in Texas, Louisiana, and Alabama. Its principal producing properties were in Southwest Texas and on the Louisiana Gulf Coast. Coronado produced approximately 2,000 bbl. of oil daily from the La Rosa pool of Refugio County and also operated a 60,000,000-cu. ft. daily capacity recycling plant in the La Rosa pool. The corporation owned producing royalties in the Luby pool of Nueces County; Chapman pool of Williamson County, and the Placedo pool of Victoria County, all in Southwest Texas.

STATE CAPITALS...

CALIFORNIA

THERE IS A STRONG POSSIBILITY that California's new conservation program, if approved by the coordinator and attorney general, may become effective January 1, 1942. It is not likely that the program even if approved can be put into effect on December 1, 1941, owing to the short time remaining and the large amount of detail to be worked out. This program, which has been in the hands of a subcommittee for several weeks, is expected to receive final approval of the production committee for District 5 and then be submitted for approval by Coordinator Ickes.

California crude-oil production has been exceeding the established allowable for several months but it is generally believed that production will be reduced immediately upon recognition of the new program and as soon as a definite plan is outlined. For the past month or two operators have been working on the problem but in the absence of any concrete results have been going along producing at the accustomed rate. It is felt that it will not be necessary to invoke priorities against California operators to secure compliance with the curtailment program.

ILLINOIS

ATTY. GEN. GEORGE F. BARRETT has advised state Auditor Arthur C. Lueder to release the first payroll of the newly created Illinois Oil and Gas Conservation Division after upholding validity of a $250,000 appropriation to administer the new program.

Mr. Lueder refused to honor vouchers of employes of the new state government agency, including Supt. G. C. Curtis and other officials, pending issuance of an opinion by the attorney general on the legislation.

The attorney general in his opinion declined to rule on constitutionality of the key bill which created the new division and gave the state Department of Mines and Minerals initial power to regulate the Illinois petroleum industry.

The appropriation measure, which allocated funds to administer the division in a "lump sum" for the next 2 years "must be regarded as valid," Mr. Barrett ruled, "in the absence of a judicial determination to the contrary."

The state auditor's request was made on November 5 and the opinion was released November 12. The action was the signal for strengthened enforcement of the act, first of its kind passed by the state legislature since new field development in 1937 projected Illinois into the national oil picture.

Superintendent Curtis and Director Robert M. Medill of the Mines and Minerals Department, who held complete enforcement of the act in abeyance pending outcome of Mr. Lueder's request, said a complete list of 13 state field inspectors, an inspector-at-large, and a production engineer, will be assigned immediately to administer the law.

"There can be no question but what S. B. 696 makes an appropriation for a governmental purpose," Mr. Barrett said. "Its sole object and purpose is to provide a department of the state government with funds to administer the provisions of a law investing that department with duties concerning the conservation of oil, gas, and coal resources of the state."

Mr. Barrett also said the only questionable feature of the appropriation bill was whether it had to itemize the funds appropriated instead of making them in a lump sum. Regarding this, he said the lump-sum appropriation was acceptable since there was no precedent upon which to base an itemized appropriation.

LOUISIANA

LEGAL ASPECTS of federal and state petroleum and petroleum-products taxation were the subjects of discussion around the state capitol of Louisiana last week. One case has been lodged in the District Court at Baton Rouge concerning the right of the state to tax gas flared in fields incidental to the production of oil. Another controversial subject was aired when the U. S. Supreme Court handed down a decision holding that petroleum products used in construction of army camps in Louisiana were subject to taxation.

No decision has yet been reached by the Baton Rouge District Court regarding the taxation of flared gas. A California company filed suit in an attempt to recover $1,651.69 tax paid recently under protest on gas flared from its oil wells in the Barataria field, Jefferson Parish. The suit immediately gained statewide importance because the decision is expected to finally settle the question of the state's right to tax this gas. Under the conservation laws the state is allowed to fix gas-oil ratios in connection with petroleum production in which a certain amount of gas is permitted to be flared. However, the state severance tax laws require taxation on all minerals. Both the revenue department and oil operators throughout Louisiana have concentrated on the case to bring the point to judicial decision, with the state maintaining the tax should be paid. Best defense for the oil operators is the fact that in producing oil it is beyond the producers' power to prevent gas from being simultaneously expelled.

PELICAN STATE DIRECTOR . . .

JOHN L. CONNOR, director, minerals division, Department of Conservation, Louisiana, whom Gov. Sam Jones named to succeed Joseph L. McHugh, when the latter was appointed acting conservation commissioner last month. Mr. Connor is from Jennings, La., and had served as Mr. McHugh's assistant when Mr. McHugh was director of the minerals division

KANSAS

FEDERAL TENDER BOARD NO. 1 opened a branch office at Wichita last week to investigate possible violations of the Connally Act. In charge is Charlest J. Eastman, senior examiner. Formerly Mr. Eastman was director of the Federal Petroleum Agency at Kilgore, Tex. Later he was in charge of the investigative office under the Connally Act established at Lansing, Mich. Since that office was closed in September 1940, he has been investigating to determine whether petroleum has been produced in violation of the proration laws of the State of Kansas and thereafter shipped in interstate commerce.

No tender is to be required of Kansas oil men on interstate shipments of crude.

TEXAS

PANHANDLE GAS production was fixed at a daily maximum of 500,000 cu. ft. per oil well in an order effective as of November 1. The former rule allowed 775,000 cu. ft. daily. The new order stated that the gas-oil ratio "shall be kept as low as possible and no oil well in the Panhandle field shall be permitted to produce more than 500,000 cu. ft. per day."

OKLAHOMA

A COMPROMISE was reached in the Hobart oil-pool dispute last week and the Corporation Commission increased the allowable for all producers to 225 bbl. of oil daily. The wells were prorated to about 125 bbl. to 191 bbl. daily until recently when some producers in the field found an increased market for production.

MARKET-DEMAND hearing for December was set by the state Corporation Commission for November 28, Earl Foster, conservation attorney, announced. Prior to the hearing a conference of producers and purchasers will be held with Joe J. O'Laughlin, conservation officer. Present allowable is 428,000 bbl. daily, unchanged for the last 2 months. Production is running near this level, so it is doubtful whether there will be any drastic change in the December quota.

OSAGE LEASES will be offered for sale for the third time this year at Pawhuska. The Indian Department authorized the sale to be held December 9, and the Osage Council prepared a list of the tracts to be offered. It was the first time in years that more than two sales have been permitted in 12 months.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

After Production

In current discussions regarding adequate prices and supplies for next year's expanded operations, attention centers in finding and producing crude oil. This is proper because obviously the first requirement is to discover and bring to the surface the needed raw material.

But producing crude oil is less than half the journey the petroleum industry of this country has to travel in delivering a wide variety of finished products required by more than three-fourths of the population and many millions of foreign consumers.

Pipe line and refinery operators in this country are now transporting and refining 500,000 bbl. daily more crude oil than they did a year ago. In addition there have been substantial increases in the pipe-line movement of products.

When new trunk lines are built they attract the attention of the entire industry. Many fail to realize that this construction is a small part of the normal growth in transportation required to keep pace with increasing production. There are now 56,000 miles of lines which gather the crude oil from more than 300,000 wells. These systems must be steadily enlarged to take care of new pools and new wells in existing fields.

A half-million barrels daily more crude oil can't be moved without new connecting lines from the fields. Existing trunk lines have to be looped and pumping equipment added. Normally this goes on from month to month as part of the routine operation.

Due to delays in obtaining delivery of pipe, expansion of these facilities within the oil country in recent months has not kept pace with the large increases in demands. Makeshift arrangements have not given many fields the outlets they should have. This deficiency must be made up and large new supplies for future growth made available if the transportation branch is to assume the responsibility of taking 500,000 bbl. daily more crude from the wells and fields before the end of another year.

Largely the same situation exists at 461 operating refineries located in 37 states. These plants are refining a half-million barrels more crude oil than they did 12 months ago and they have not been able to add the equivalent in refining capacity. They have taken care of the record demands because they had excess capacity and because refiners have a habit of getting around difficulties with a minimum of complaint and confusion.

Most refinery operators must install additional processing equipment if they are to operate efficiently and assume their share of the enlarged output of products required for next year. They require additional power, crude-distillation and cracking units quickly.

It is true that current reports give these active plants an additional 500,000-bbl. capacity over and above the present level of operations. But this consists largely of topping facilities and in modern refineries topping is only the start of plant processing.

Refiners are rapidly making provision to triple the production of 100-octane gasoline. They will provide any other special products that future defense and war requirements may require. At the same time they realize that they must have more of the regular processing equipment including the auxiliary operations.

This of course is not all. After the pipe-line transportation and manufacturing operations are completed, then come the wholesale and retail distribution of products through tens of thousands of outlets to millions of customers. Marketing in itself is a major enterprise.

Unless conditions in transportation, refining and distribution are fully understood and provided for in the planning now under way, the industry will wake up shortly and find itself in the position of having no place to go with part of the record quantities of crude oil it proposes to produce.

PRIORITIES

Answers to a few of the most pertinent questions asked about procurement of petroleum equipment

QUESTION: I understand that a list of data has been prescribed by the Office of Petroleum Coordinator covering the information which operators should supply with requests for preference rating assistance in obtaining materials for exploratory wells. Can you supply details?—O. C. S.

ANSWER: The District 3 production office of OPC has issued the following suggested procedure where priorities assistance is requested on wildcat wells with respect to the information that should be furnished.

1. Location: (*a*) State, county or parish and survey; (*b*) legal description of property and location of well.
2. Ownership map.
3. Type prospect: (*a*) Geophysical, (*a*-1) seismograph, (*b*-1) torsion balance, (*c*-1) gravity material, (*d*-1) geochemical, (*e*-1) other methods. (*b*) Subsurface; (*c*) surface; (*d*) none; (*e*) possible surface area of pool by preliminary geological estimation.
4. Proposed depth.
5. Geological section expected to penetrate: (*a*) Possible producing horizon.
6. Location and names of pools of nearest production: (*a*) Depth; (*b*) gravity, octane number, and lubrication qualities of oil.
7. Transportation facilities: (*a*) Location and distance of nearest trunk pipe line; (*b*) location and name of nearest rail facilities; (*d*) location and name of nearest canal or river facilities.
8. Possible destination of oil if discovered.
9. Contractual requirements for spudding data.
10. Name and address of drilling contractor.
11. Type of fuel to be used in drilling: (*a*) Estimated amounts, (*a*-1) gas in thousand cubic feet, (*b*-1) barrels of oil, (*c*-1) kilowatt hours.
12. List of all materials necessary for well completion, including christmas trees, flow line, separators and lease tankage, designating satisfactory sizes and pressure capacity of all material.
13. This data is to be furnished in quadruplicate, along with a signed PD-1 request for priority.

Where priorities assistance is requested for development in proven but undeveloped fields and reservoirs, the following information should be given for each field or reservoir:

(*A*) Name and location of field.

(*B*) Lease data: (1) Principal operators; (2) unitized or jointly operated; description of plan.

(*C*) Description of field: (1) Area; (2) type of structure: (*a*) Producing horizons; (*b*) depths; (*c*) thickness of pay; (4) water-level; (5) porosity; (6) permeability.

(*D*) Sand data.

(*E*) Well data: (1) Number of wells (oil-gas-dry-pressure); (2) spacing; (3) typical casing record; (4) perforations record.

(*F*) Production data: (1) Past production by months, by wells, or by leases; (2) total daily (field) productive capacity; (3) allowable production (day and month); (4) number wells flowing, pumping, gas lift, air lift; (5) gas-oil ratio; (6) initial and present bottom-hole pressure; (7) accumulated production vs. pressure decline.

(*G*) Development data: (1) Actual or proposed development plan; (2) number wells required to complete development program; (3) lease storage requirements; (4) gathering system requirements; (5) gathering system storage requirements.

(*H*) Material and equipment data: (1) Type of drilling equipment; (2) casing sizes and lengths: (*a*) surface, (*b*) oil string, (*c*) tubing size and length, (*d*) separator requirements, (*e*) christmas tree assembly and pressure requirements, (*f*) lease storage requirements, (*g*) pipe-line storage requirements, and (*h*) oil-treating requirements.

(*I*) Reserves data: (1) Total for field; (2) per acre; (3) method of computation.

(*J*) Marketing data: (1) Capacity of pipe lines or other facilities; (2) probable destination of crude; (3) properties of crude: (*a*) gravity, (*b*) type of crude (paraffinic, asphaltic, naphthenic), (*c*) gasoline content and octane number; (4) lubricating qualities.

(*K*) General data: (1) Ownership map; (2) development map; (3) structure map; (4) typical log or Schlumberger; (5) geological cross-section.

This is another of the special-service series of questions and answers on priorities for the petroleum industry which has been appearing each week since the September 11 issue.

The plan for allocating a specific volume of steel to the petroleum industry for its operations is still pending in Washington, D. C. Also pending is proposal to place petroleum on the list of critical materials and through that relationship establish a preference-rating position of A-8 for the industry's equipment requirements.

The Oil and Gas Journal has made arrangements to secure authoritative answers to questions arising among operators in all branches of the petroleum and natural-gas industries and manufacturers and suppliers of materials and equipment on preference ratings. Questions are invited and should be addressed to The Oil and Gas Journal, Priorities Question Department, P.O. Box 1260, Tulsa.

QUESTION: What standards are used in determining whether equipment for the oil industry is for repair and maintenance or for services which do not qualify under strict interpretation of Preference Rating Order P-22.—A. H. R.

ANSWER: It should be emphasized that in applying the A-10 rating, it is the purpose for which equipment is to be used, not the equipment itself, which is determinative of the right of any operator to apply the A-10 rating. Thus, although many types of equipment can be obtained under P-22, only such equipment can properly be obtained under the order as is to be used for "maintenance, repair and operating supplies" as defined in the order. Any use of the order to obtain equipment for other purposes is a violation of the policy behind the order, as well as a violation of the specific provisions incorporated therein.

In determining the proper purposes for which materials may be obtained, it should be noted that "operating supplies" means only material which is essential to the operation of a user's business and which is consumed in the course of such business.

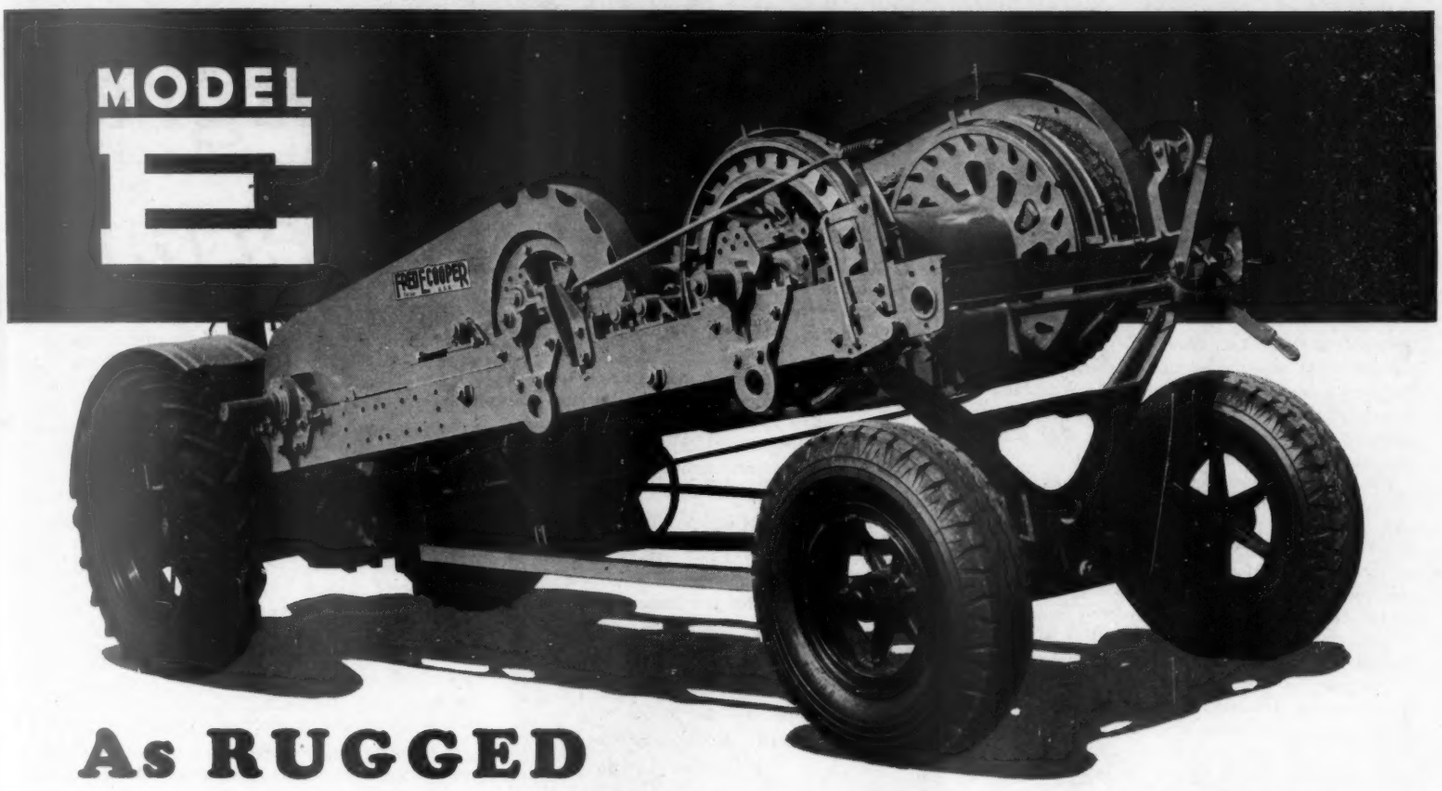
It should also be noted that "operating supplies" do not include material which is to be physically incorporated in whole or in part into any product of the user, or into any material which the user distributes to or stores, transports, or services for another person. The terms "maintenance, repair, and operating supplies" do not include material which is to be used for additions to, or expansion of, a user's property or equipment.

QUESTION: Who is responsible for any misuse of Preference Rating Order P-22?—W. D. B.

ANSWER: The actual user of the equipment ordered under P-22 is the only person entitled to initiate the A-10 rating. It follows, therefore, that such person will be the one held primarily liable for any misuse of the order. To operators in the industry, this means that they must be careful to see that they comply with provisions of P-22 before endorsing the certification which permits them to apply the A-10 rating.

QUESTION: In what manner would the A-8 priority number be applied to equipment and supplies for the oil industry as has been under discussion in recent weeks?—G. W. B.

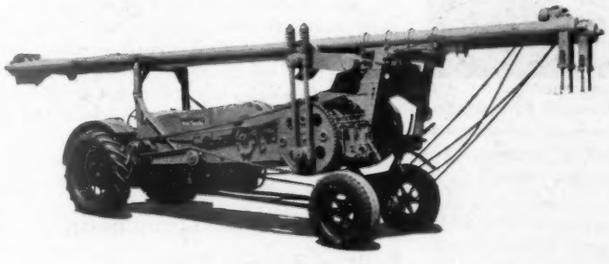
ANSWER: The general plan as now constituted but still pending final approval, involves designation of petroleum as a critical material. Sufficient production would be allocated to essential defense industries to cover their requirements and remainder would be distributed under the general preference system. The products of the industry would be given an A-8 rating and the producers in turn could use this priority position to obtain the necessary operating materials. Distribution as among the individuals and companies in the industries may be regulated through district offices of the OPC and field offices of OPM perhaps along the general lines applying now to building materials.



As RUGGED as an army tank and as FAST...

For an all purpose well servicing and drilling unit select the New Model E Double Drum Winch Tractor with 58,970 lbs. line pull. It easily handles the tought rod, tubing and bailing jobs on deep wells. When the unit is equipped with telescoping mast, spudder and rotary drive sprocket, it makes an excellent machine for well deepening and drilling with either rotary or cable tools.

This unit is optional with either 15 m.p.h. or 30 m.p.h. road speeds. Heavy duty tractor-type transmission has four speeds forward and one reverse. All winch drums have Cooper, patented, circulating air-cooled, self-equalizing service brakes. This unit is also available as the Model E Single Drum Winch Tractor. These units are also available as skid models for truck or semi-permanent mounting.



Allis-Chalmers Manufacturing Company and Fred E. Cooper are participating in the program for national defense. So far this co-operation has not seriously curtailed our ability to supply the Oil Industry with well servicing, drilling units and power engines. Should this time come, and you experience some inconveniences in securing this equipment, we can only ask your patience, that the prime need may be supplied first.

CONDENSED SPECIFICATIONS, MODEL E DOUBLE DRUM UNIT

Drum Speeds	Drum Capacities	Spudder	Mast	Engine	Power	Fuel
Eight speeds quickly available, up to 1,074 ft. p.m. at 1,200 r.p.m. of engine.	FRONT DRUM — 9,740 ft. of ½" line. REAR DRUM—7,330 ft. of ½" line.	New design with variable stroke. Crank type. Stroke: 27", 35" and 43".	Three weights, single pole. Capacities 17,000 to 96,700 pounds. Three weights, double pole. Capacities: 37,770 to to 214,880 pounds.	Valve-in-head, four cylinders, 5¼" bore, 6½" stroke, 563 cubic inch displacement.	TORQUE 400 foot pounds	Natural gas Butane Gasoline Distillate

W.P.R.A. Technicians Agree Lower-Octane Fuels Certain

By R. MARNE SANFORD

SHREVEPORT, La., Nov. 17.—A well-attended technical meeting of the Western Petroleum Refiners Association was held in the Washington-Youree Hotel here last Friday. It was a questions-and-answers type meeting featuring free discussion and participation.

The meeting was under the supervision of Leon C. Grosjean, formerly director of the Louisiana and Arkansas branch of the association and now located in the central office at Tulsa. Questions on refinery operation and maintenance as well as ones on the chemistry of refinery technique were openly thrashed out, thereby creating interest for all groups of men present regardless of which branch of the refining industry they were in.

Chairman of the meeting was A. W. Trusty, chief chemist, Arkansas Fuel Oil Co., Shreveport, whose capable handling of questions-and-answers meeting in the association for the past 7 or 8 years assured at the outset an interesting and informative discussion.

In a discussion on the question of present war conditions and their effect on such items as gasoline octane numbers, tetraethyl lead shortage, and possible forced reduction of octane number gasoline for the general motoring public, several conclusive statements were made. It was agreed that the Government has accepted 80-octane gasoline as standard fuel for its Army vehicles and 100 octane for its planes. This represents a rise in octane number over previous standard fuel, thus more tetraethyl lead is required for its making. The public will be forced to absorb this lead shortage and will therefore have to limit its gasoline consumption to lower octane. It was estimated that possibly a 68 to 70-octane bracket would become widely used as the general public's second grade or regular gasoline.

Under this same topic of discussion it was pointed out that the automobile manufacturer would be forced to absorb some of the loss in that he would have to redesign motors of the future with a lower compression head to fit lower-octane gasolines. One informed source at the meeting stated that approximately 20 per cent of tetraethyl lead available now is going into the making of aviation gasoline and if a shortage is not at present felt on lead, it will be within a few months.

Metals Shortage to Affect Refiner and Public

An interesting and factual discussion was held on the questions of whether the scarcity of metals will necessitate greater refinery care in corrosion and erosion, and also whether this metals shortage will have any part in reducing the amount of oil and refinery products delivered in tin cans and steel drums and containers. Regarding the greater care in refinery corrosion and erosion it was agreed that in many instances refinery still tubes were being cut up and the good parts welded together for further use due to the shortage of steel for this purpose. It was also agreed that there is already apparent a definite trend toward the replacement of steel and tin drums and containers. Where tin oil cans were once used for canned oil at the service stations, there are now plate-iron containers used, and the trend is back toward the old practice of glass or wooden containers. It was pointed out that at refineries in the Southwest a charge or deposit was being placed on steel or iron oil drums when the contents were delivered and upon the return of the drum the deposit was refunded. Probably some time in the near future the refiner will be forced to submit an itemized approximation of steel and the number of drums needed over a 6-month period and will receive only what is requested and will be held accountable for these. At present a

A. W. Trusty, chief chemist, Arkansas Fuel Oil Co., Shreveport, La., who was chairman of the questions-and-answers meeting of the Western Petroleum Refiners Association held in Shreveport last Friday

$6 charge on 30-gal. drums and a $3 charge on smaller drums is in use in some places. It was pointed out that one large refinery in the Mid-Continent area would not assure delivery of lube oil unless drums for shipment therein were furnished.

Many questions regarding trends and general practices at the refinery were discussed pro and con with little definite conclusion being drawn. Whether or not ice towers for humidifier control on the octane machines had been installed brought comment both for and against the practice. Regarding the lining of towers with carbon-steel strips it was decided that if towers were lined usually the metal used was stainless steel and that the strips were found to operate best when installed horizontally in the walls and vertically in the top.

Partially returning to the question of whether steel shortage would effect greater care in preventing corrosion or erosion, it was pointed out that in many cases refinery still tubes would have to have new tips welded on and be put to further use rather than completely replacing them. Under this head a general discussion took place regarding the best way to weld new tips onto the tubes to prevent corrosion and erosion at the point of the weld. When two pieces of tubing are welded together and one has been subjected to greater use than the other, thus having more erosion and a thinner tube wall, it was pointed out that erosion always took place on the downstream side of the weld. Only tubes of approximately similar wall thickness should be welded together, and prior to placing the bead, both ends of the tube should be heated, thus preventing too great a molecular differential between the point of weld and the remainder of the tube. This, it was pointed out, would greatly reduce the erosion and corrosion in welded tubes.

In drawing the discussion to a close, there was general agreement that, regarding the Government's desire to finance high-octane refining plants, the Government's wish for too large a plant would prove a great drawback. The Government could not assure the refiner a sufficiently long-term contract to retire the original investment, and outside of this, the Government speaks of high-octane alkylation-type plants in terms of 3,000 and 5,000 bbl. daily output and no one refiner or small group of refiners could furnish sufficient feed stocks to insure an output of this capacity.

In general the discussion at the meeting showed greater interest than in such previous type gatherings. This was apparent in the nature of the discussion and also in the number of questions submitted by refiners in the area. Usually there are some 15 to 20 problems submitted, but there were 62 confronting the meeting Friday. Only about one-third of these were covered and the remainder will be taken up, along with any new ones, at the association's next question-and-answer meeting to be held in Shreveport the second Friday in January.

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New Oil Tanker Launched; Built in Record Time

CHESTER, Pa., Nov. 15.—A 19,200-ton oil tanker, the S.S. John D. Gill, of Atlantic Refining Co., was launched today at the yards of the Sun Shipbuilding & Dry Dock Co. here. The new vessel was built in the record time of 18 weeks to combat the wartime shortage of tank ships. Its keel was laid July 11, 4 days after a sister ship, the S.S. W. C. Yeager, was launched.

The big tanker was sponsored by Mrs. John D. Gill of Philadelphia, Pa., wife of a company director in whose honor the vessel was named. It is the seventh new vessel to be added to the company's fleet in the last 4 years, in a major fleet expansion program designed to enable the company to transport increasing quantities of crude oil, in its own bottoms, from Texas Gulf ports to the Philadelphia refinery. Including this newest addition, the company's fleet comprises 26 vessels.

Watching WASHINGTON

By HENRY D. RALPH

Better cooperation between industry and OPC seen . . . Regional marketing chairmen to discuss container issue . . . Issue orders to expedite steel-drum manufacture . . . Petroleum coordinator still studying price situation . . . Modify export licensing control . . .

WASHINGTON, D. C., Nov. 18.—Fuller cooperation between the petroleum industry and the Office of the Petroleum Coordinator is expected in the near future, partially as a result of the attendance of a large group of the staff of the OPC at the annual meetings of the Independent Petroleum Association of America and the American Petroleum Institute.

At these meetings OPC officials for the first time had an opportunity to circulate through the industry and to obtain a better view of the problems with which it is faced. While the industry has always been willing to cooperate in the defense program, there has been some feeling that the industry committees appointed to advise and confer with the OPC, were called upon to advise very little and the results of the few conferences which have been held were nil.

The first step in the "new deal" was taken a little over a week ago when the OPC in an amendment to one of its formal recommendations, reversed its earlier stand of insisting on the utmost secrecy with respect to all actions taken either by the coordinator's office or by the committees, and urged the committees to release full and accurate reports on all decisions made and actions taken.

The next step is expected to be a gradual reorganization of the industry committee setup, with the committees being given more responsibility and additional representation on the committees from sectors of the industry not now represented.

It is expected that this action will be taken over a period of time and the changeover will be almost imperceptible. However, when completed, it is contemplated that the entire industry will be "coordinated" into a single unit, eliminating all waste movement and duplication of work by several companies. Done in the name of national defense and with the blessing of the Department of Justice, violations of the antitrust laws will be forgotten for the duration, in order to bring the industry to the highest point of efficiency possible.

REGIONAL chairmen of the industry marketing committees will meet in Washington, D. C., Monday, November 24, and Tuesday, November 25, to confer on various oil-marketing problems. The conference was called by Dr. John W. Frey, director of marketing of the Office of the Petroleum Coordinator.

Part of the 2-day session will be given over to a joint conference with the Container Division of the OPM to work out the most practical use of substitute materials in the manufacture of containers for petroleum products.

THE U. S. Supreme Court last week made absolute disposition of the treble-damage suit brought by Twin Ports Oil Co., a gasoline jobber of Duluth, Minn., against Pure Oil Co., when the court denied the Twin Ports' petition to reconsider its petition for a writ of certiorari.

The Supreme Court on October 13 had previously denied the plaintiff's petition for a writ of certiorari and thereby refused to review a decision of the Eight U. S. Circuit Court of Appeals.

THE Priorities Division of the Office of Production Management issued two orders last week designed to make possible the speedy manufacture of steel drums for overseas shipment of gasoline, oil, and other petroleum products. The orders are effective immediately.

Under the first of these orders, General Preference Order M-45, manufacturers of steel drums will be required to set aside a specified inventory of the 16 and 18-gage hot-rolled sheet steel from which the drums are made. This inventory is to be used only upon specific order of the director of priorities.

The companion order, making up the other half of the program, is Preference Rating Order P-76. It extends a rating of A-4 to deliveries of the sheet metal to drum manufacturers for the purpose of replenishing the original inventory. Any sheet steel acquired with the assistance of this order must be held under the same conditions as the originally designated inventory.

A manufacturer is not required to set aside more than the original reserve inventory, and he is not required to replace it. If he wishes to do so, however, he can use the preference rating extended by P-76 to acquire the necessary stock.

It was explained that this method of assistance is extended because orders for overseas shipments are frequently placed on an emergency basis, often within 1 week of sailing dates. It is impractical to create a standing stockpile of finished drums, because of the large areas which would be required for storage. In place of this, the stockpile of the basic raw material is provided.

THE OPC is now completing its study of the requested increase in price of Mid-Continent crude, amounting to 25 cents per barrel, but Mr. Ickes stated last week that he is not prepared to make any announcements concerning the results of the study.

The Office of Price Administration is also making a study of the situation, but this investigation is not expected to be completed for several months. Reports are that OPA will not make any decision with respect to the increase until after the pending price-control bill is enacted into law. Present indications are that this will not happen until after the first of the year. Meanwhile, the oil companies will be forced to absorb all increases in costs of material and labor.

These costs have been steadily rising during the past few months and are now reaching a point where it is almost impossible to absorb them. Increased costs of production are hitting the independents most severely. Among a number of independent producers who have been protesting current ceilings on crude prices, Walter W. Lechner, of Dallas, Tex., has been in Washington for the past week for a series of conferences with federal officials for the purpose of urging a general increase in prices.

Mr. Lechner conferred with Price Administrator Leon Henderson, representatives of the OPC and the Texas congressional delegation. He pointed out that increased costs of operation in the industry have ranged from 10 to 30 per cent in southwestern producing areas, and declared that this sharp increase more than justifies a corresponding increase in crude prices.

The industry is doing its best to cooperate with the Government and to meet all demands placed upon it in connection with the defense program, Mr. Lechner said, but thus far has had to bear the entire burden of increasing costs of production without being permitted to pass on any of these costs through higher prices.

THE Office of Export Control has issued Petroleum Informational Sheet No. 2, announcing modification of export licensing control in respect to shipment of low-grade petroleum products, extending to the Atlantic ports of the United States the same regulations as those in effect at the Gulf and West Coast ports.

Relaxation of this control permits resumption of exportation of certain petroleum products from Atlantic Coast ports to countries to which such shipments had been discontinued during the recent oil emergency in the eastern states.

Uniform general licenses are now in effect replacing special general licenses GEG and GEH, and making applicable to all points of export the regulations governing exportation of petroleum products and tetraethyl lead to countries of approved destination. In effect, this modification of control means that Atlantic Coast exporters may now also ship to the Netherlands Indies, Free China, the Belgian Congo, Free France, Canada, Newfoundland, Iceland and Great Britain and Northern Ireland, as well as the other American republics.

Shippers must continue to furnish affidavits certifying that certain petroleum products included in their export proposals do not meet aviation-grade specifications. High-grade petroleum products are permitted as heretofore to be exported under general license only to Canada, Great Britain and Northern Ireland, Newfoundland, Iceland, and the Philippine Islands.

Domestic Motor-Fuel Use 12.2 Per Cent Above 1940

THE increase in domestic demand for motor fuel was maintained at 12.2 per cent over 1940 through the first 9 months of this year, it was disclosed this week in the monthly petroleum summary of the Bureau of Mines. Total demand for motor fuel is only 11.1 per cent higher than a year ago because of the continued depression of exports which were down 14.7 per cent through the first 9 months compared to a year ago.

Indicated domestic demand for crude oil through the end of September was 7 per cent greater this year than in the first 9 months of 1940, but a decrease of 36.7 per cent, totaling 14,833,000 bbl., in exports modified the gain in total requirements to 5.3 per cent.

Total demand for all oils in the United States was up 8.3 per cent through the first 9 months. Every petroleum product is being consumed this year in the United States at rates exceeding 1940 by 1.6 per cent in the case of kerosene to 64.6 per cent in the case of aviation gasoline.

UNITED STATES SUPPLY AND DEMAND

Nine months, 1941 and 1940. (All figures in thousands of barrels)

Crude Oil

9 Months—	Total supply	Total demand	Excess demand	Excess Pct.	Domestic production	Imports	Indicated domestic demand‡	Exports	Stocks refinable crude Sept. 30§
1941	1,062,723	1,082,276	19,553	1.8	1,026,389	36,334	1,056,657	25,619	246,111
Daily average	3,893	3,964	.....	..	3,760	133	3,871	94	....
1940	1,051,263	1,027,817	*23,446	*2.3	1,021,005	30,258	987,365	40,452	263,124
Daily average	3,865	3,751	.....	..	3,726	110	3,604	148	.....
Increase, 1941	11,460	54,459	.....	..	5,384	6,076	69,292	†14,833	†17,013
	1.1%	5.3%	.....	..	0.5%	20.1%	7.0%	†36.7%	†6.5%

Refinery Products—Motor Fuel

9 Months—	Total supply	Total demand	Excess demand	Excess Pct.	Domestic production	Imports	Domestic demand	Exports	Stocks Sept. 30§
1941	504,450	509,963	5,513	1.1	503,854	596	493,958	16,005	78,134
Daily average	1,848	1,868	.....	..	1,846	.....	1,809	59	.....
1940	460,131	458,900	*1,231	*0.3	460,052	79	440,130	18,770	82,953
Daily average	1,679	1,675	.....	..	1,679	.....	1,606	69	.....
Increase, 1941	44,319	51,063	.....	.	43,802	517	53,828	†2,765	†4,819
	9.6%	11.1%	.....	..	9.5%	.....	12.2%	†14.7%	†5.8%

Aviation Gasoline

1941	14,474	11,341	*3,133	*27.6	14,474	.....	7,814	3,527	7,521
1940	10,552	8,162	*2,390	*29.3	10,552	.....	4,746	3,416	6,018
Increase, 1941	3,992	3,179	.....	..	3,922	.....	3,068	111	1,503
	37.2%	38.9%	.....	..	37.2%	.....	64.6%	3.2%	25.0%

Kerosene

1941	53,164	51,014	*2,150	*4.2	53,106	58	49,388	1,626	11,662
1940	54,196	51,518	*2,678	*5.2	54,061	135	48,592	2,926	10,254
Increase, 1941	†1,032	†504	.....	..	†955	†77	796	†1,300	1,408
	†1.9%	†1.0%	.....	..	†1.8%	†57.0%	1.6%	†44.4%	13.7%

Distillate Fuel Oils

1941	142,958	136,313	*6,645	*4.9	139,251	3,707	124,913	11,400	51,412
1940	139,606	126,490	*13,116	*10.4	137,242	2,364	110,911	15,579	48,928
Increase, 1941	3,352	9,823	.....	..	2,009	1,343	14,002	†4,179	2,484
	2.4%	7.8%	.....	..	1.5%	56.8%	12.6%	†26.8%	5.1%

Residual Fuel Oils

1941	274,285	287,287	13,002	4.5	250,703	23,582	276,491	10,796	83,752
1940	254,164	257,621	3,457	1.3	234,224	19,940	245,157	12,464	94,947
Increase, 1941	20,121	29,666	.....	..	16,479	3,642	31,334	†1,668	†11,195
	7.9%	11.5%	.....	..	7.0%	18.3%	12.8%	†13.4%	†11.8%

Lubricating Oils

1941	28,884	30,237	1,353	4.5	28,884	.....	23,317	6,920	7,415
1940	27,925	26,471	*1,454	*5.5	27,925	.....	17,851	8,620	8,596
Increase, 1941	959	3,766	.....	..	959	.....	5,466	†1,700	†1,181
	3.4%	14.2%	.....	..	3.4%	.....	30.6%	†19.7%	†13.7%

Petroleum Wax (Thousands of Pounds)

1941	485,816	531,630	45,814	8.6	479,640	6,176	398,977	132,653	79,458
1940	450,677	416,297	*34,380	*8.3	382,480	68,197	257,103	159,194	110,028
Increase, 1941	35,139	115,333	.....	..	97,160	†62,021	141,874	†26,541	†30,570
	7.8%	27.7%	.....	..	25.4%	.....	55.2%	†16.7%	†27.8%

*Excess supply. †Decrease. ‡Crude only. §Includes finished and unfinished refinery gasoline and natural gasoline. Note: Total supply equals domestic production plus imports. Total demand equals domestic demand plus exports. Data on demand for refined products based on refinery shipments. ‖Does not include 10,321,000 bbl. of heavy oils in California. Comparable figures for September 30, 1940, 12,562,000.

Crude Oil Run to Stills and Total All Oils

9 Months—	Total imports‖	Total exports‖	Total crude to stills	Per cent yield gasoline‡	Natural gasoline production	Total supply all oils*	Total demand all oils*	Stocks all oils Sept. 30*
1941	67,031	75,237	1,035,896	43.9	46,176	1,142,159	1,160,590	544,216
Daily average	245	276	3,794	...	169	4,184	4,251	.....
1940	59,671	102,435	969,822	43.0	40,411	1,123,378	1,071,329	576,819
Daily average	218	377	3,539	..	147	4,100	3,910	.....
Increase, 1941	7,360	†27,198	66,074	...	5,765	18,781	89,261	†32,603
	12.3%	†26.6%	6.8%	...	14.3%	1.7%	8.3%	†5.7%

*Total all oils includes crude and refined products, natural gasoline, and benzol. Stocks September 30, 1941, represented 128 days' supply, which compares to 148 days on the same date in 1940. †Decrease. ‡Does not include natural gasoline blended at refineries. ‖Includes crude oil and refinery products. In case of imports includes receipts in bond for domestic use but excludes "shuttle" movement. All data based on Bureau of Mines report.

Reserve Needs Indicate Price Advance Quickest Solution

(Continued from Page 14)

difficult task," Mr. Davies declared at last month's meeting of the I.P.A.A. in Tulsa. "I do not refer," he continued, "to the substantial successes of 1,000,000-bbl. pools, or even 10,000,000-bbl. pools. With our present consumption, at the rate of 1½ billion barrels annually, we must find numerous fields of 100,000,000 bbl. or more, merely to retain our present reserve position, without regard to the desirability of increasing our known reserves in proportion to the annual increase in consumption."

Mr. Davies repeated his general conclusions on the exploratory necessities at the A.P.I. meeting again this month in San Francisco, Calif.

Several of the independent studies of the cost of producing crude made in recent weeks by companies in the industry indicate that a substantial percentage of the increase is for the finding of new oil fields. Some companies have concluded that the costs of producing oil, including exploration charges along with other phases of operations, have increased around 25 per cent.

Diversion of a higher percentage of drilling operations to exploratory locations will, if the history of probable success prevails, advance costs substantially in proportion to the extent work of this nature is prosecuted.

Consequently, all elements in the oil industry are concerned over the apparent reluctance of Price Administrator Henderson to allow normal relations between crude postings, product prices, operating costs, supply and the scores of other ramified factors involved.

Oil operators feel that if government agencies are working toward a common goal of permitting the petroleum industry to improve its position as an indispensible cog in the national-defense machinery there can be but one answer to the question of reserves—the chances of return on the risk of exploration must be approximately equivalent to those that have proven productive of results in the past. Resentment is expressed by competent oil men over restrictions applied at the one point in the economic framework of the industry that is most amenable to accomplishment of the results sought.

AVERAGE CRUDE PRICES, RESERVES, PRODUCTION AND YEARS' SUPPLY

	Avg. price	Reserves (Thousands of barrels)	Production in preceding yr. (Thousands of barrels)	Years' supply
1922	$1.61	5,000,000	472,000	10.6
1923	1.34	5,100,000	557,000	9.2
1924	1.43	5,200,000	732,000	7.1
1925	1.68	5,321,000	714,000	7.5
1926	1.88	6,115,300	764,000	8.0
1927	1.30	6,909,600	771,000	9.0
1928	1.17	7,704,000	901,000	8.6
1929	1.27	9,071,000	901,000	10.1
1930	1.19	9,199,000	1,007,000	9.1
1931	.65	10,578,000	898,000	11.8
1932	.87	11,289,000	851,000	13.3
1933	.67	12,000,000	785,000	15.3
1934	1.00	13,360,000	906,000	14.7
1935	.97	13,632,000	908,000	15.0
1936	1.09	14,744,000	994,000	14.8
1937	1.18	15,856,190	1,073,000	14.8
1938	1.13	17,750,839	1,279,000	13.9
1939	1.00	18,232,774	1,214,000	15.2
1940	1.00	19,687,379	1,264,000	15.7
1941	1.10	20,099,258	1,352,000	15.0

International

Venezuelan Crude Production of 648,726 Bbl. Daily Sets New Peak

ANOTHER production peak was set for Venezuela during September when daily average output jumped to 648,726 bbl., an increase of about 18,300 bbl. compared to the August rate which at that time also constituted a new record. There was an increase of 20,685 bbl. in the September daily production from the Lake Maracaibo fields which was more than sufficient to offset a decline of 1,461 bbl. in the yield per day from eastern Venezuela.

Comparison of September production records with those of a year ago gives a more significant trend in withdrawals from Venezuelan fields. Production in September 1940, averaged 485,122 bbl. daily, one of the lowest figures reported by South America's largest oil country in recent years. Production in September this year is more than 33 per cent greater than a year ago and emphasizes a trend that has been gaining momentum since June.

The Lagunillas field, in the Lake Maracaibo district, contributed most substantially to the September increase. Production from this field gained 139,710 bbl. in September. The daily average output, however, was up 11,200 bbl. in September compared with August and was 45,937 bbl. higher than in September 1940.

There were few significant variations in the average production from fields in the eastern part of the country. The new Santa Barbara field, operated by Compania Consolidada de Petroleo, subsidiary of Consolidated Oil Corp., more than doubled its rate of production in yielding 4,510 bbl. in September compared to 2,045 bbl. in August.

A substantial gain in production was registered by Texas Co. (Venezuela), Ltd., which reported 4,560 bbl. of crude output in September against 1,515 bbl. in August.

Most of the new production in the eastern part of Venezuela is being withdrawn from the comparatively new fields in the State of Anzoategui, including Santa Ana, San Joaquin, and El Roble. Current production of 18,240 bbl. daily from Standard Oil Co. of Venezuela's Jusepin field is nearly double the rate of 9,351 bbl. daily reported from that area a year ago. Santa Ana's September production of 18,070 bbl. this year is about 2½ times greater than a year ago; San Joaquin is producing just a little less than twice its output rate in 1940 as is El Roble. Leona, another new field in Anzoategui, more than doubled its production rate of August by contributing 9,265 bbl. to the September total.

Lago Petroleum Corp. was the only Venezuelan operating company to report a substantial increase in production for September compared to August. From a percentage-increase standpoint, gains scored by Texas Co. and Compania Consolidada were more impressive but the two concerns are comparatively new producers in Venezuela and neither yet contribute materially to the output of the country. The substantial increase of about 529,000 bbl. in Lago Petroleum Corp. production for September compared with August came largely from the Lagunillas field.

Output by companies in the Shell group was off in September. Mene Grande, Gulf Oil Corp. subsidiary, reported a decline of nearly 210,000 bbl. in September compared with August.

Petroleum exports from Venezuela totaled 17,208,125 bbl. in September compared to 17,785,880 bbl. in August. The daily average, however, in the more recent month of 573,604 bbl. was only 134 bbl. under the August rate. Shipments from the Maracaibo customs district averaged 461,236 bbl. daily in September compared to 438,770 bbl. in August but exports from the other two districts, Maturin and Barcelona, were lower in September.

Details of production and exports follow:

VENEZUELAN CRUDE-OIL PRODUCTION

(By fields)

	Sept. 1940	Aug. 1941	Sept. 1941
Cabimas	1,239,425	1,844,015	1,916,185
Lagunillas	4,847,210	6,085,635	6,225,345
Tia Juana	2,733,345	4,354,300	4,334,305
Bachaquero	187,015	12,535	14,530
Total Lake fields	9,006,995	12,296,485	12,490,365
Daily average	300,233	396,660	416,345
La Concepcion	58,355	105,900	118,455
La Paz	35,230	36,205	32,830
Mene Grande	885,040	1,147,340	1,116,210
El Cubo	506,525	598,710	551,730
Cumarebo	66,170	152,990	157,755
Las Palmas	2,285	735	2,505
El Mene de Mauroa	20,335	18,695	17,680
Hombre Pintado	51,500	47,530	44,810
Mara district	.....	5,170	3,720
Quiriquire	1,519,110	1,799,520	1,719,780
Pedernales	145,885	133,150	126,155
Temblador	332,635	255,995	188,185
Oficina	1,444,095	2,002,870	1,937,495
Jusepin	280,535	540,215	547,180
Santa Ana	7,265	19,095	18,070
San Joaquin	112,255	227,045	216,355
El Roble	69,395	125,575	132,345
El Tigre	3,030	.....	.....
Leona	.....	4,570	9,265
Guario	885	8,875	8,005
Socororo	4,630	.....	.....
Santa Rosa	.....	13,810	12,635
El Mene de Acosta	155	.....	.....
Rincon Largo	.....	1,535	4,560
Los Caritos	1,360	.....	.....
Santa Barbara	.....	2,045	4,510
Tabasco	.....	.....	1,185
Total other fields	5,546,675	7,247,555	6,971,420
Daily average	184,889	233,792	232,331
Grand total	14,553,670	19,544,040	19,461,785
Daily average	485,122	630,452	648,726

(By companies)

	Sept. 1940	Aug. 1941	Sept. 1941
Caribbean Pet. Co.	885,045	1,147,340	1,116,210
Venezuelan Oil Concessions, Ltd.	3,966,075	4,803,745	4,551,770
Colon Development Co.	506,520	598,715	551,730
Lago Petroleum Corp.	3,428,140	6,008,990	6,527,745
Mene Grande Oil Co.	3,369,765	3,877,805	3,669,965
British Controlled Oilfields	20,335	18,695	17,680
Central Area Exploitation Co.	51,500	47,530	44,810
Standard Oil Co. of Venezuela	2,304,235	3,008,710	2,946,965
Compania de Petroleo Lago	19,655	14,905	14,165
Socony-Vacuum Oil Co.	885	8,875	8,005
Texas Co. (Venezuela), Ltd.	1,360	1,515	4,560
Compania Consolidada de Petroleo	.....	2,045	4,510
Orinoco Oil Co.	.....	5,170	3,720
Total	14,553,670	19,544,040	19,461,785

VENEZUELAN PETROLEUM EXPORTS

(From Maracaibo)

Company and destination—	Aug. 1941	Sept. 1941
Caribbean Pet. Co., Curacao	142,990	137,840
Venezuelan Oil Concessions, Ltd., Curacao	5,002,100	4,584,115
Colon Development Co., Curacao	539,820	555,265
British Controlled, Curacao	56,760	14,940
Central Area Exploitation, Curacao	.....	27,475
Lago Pet. Corp., Aruba	5,234,160	5,980,430
Lago Pet. Corp., Las Piedras	708,975	807,885
Mene Grande Oil Co., Las Piedras	1,700,330	1,528,905
Mene Grande Oil Co., Aruba	.....	18,770
Standard of Venezuela, Trinidad	22,680	.....
Standard of Venezuela, United States	.....	123,670
Standard of Venezuela, Canada	94,070	57,785
Total Maracaibo	13,601,885	13,837,080
Daily average	438,770	461,236
(From Maturin)		
Standard of Venezuela, Aruba	860,150	352,260
Standard of Venezuela, Guiria	169,015	146,045
Standard of Venezuela, Canada	163,700	472,500
Standard of Venezuela, United States	95,395	117,610
Standard of Venezuela, Tenerife	38,220	39,425
Standard et al (from Boca de Urocoa), Guiria	356,975	170,405
Total from Maturin	1,683,455	1,298,245
Daily average	54,305	43,275
(From Barcelona)		
Standard and Mene Grande, United States	938,265	1,223,115
Standard and Mene Grande, Aruba	1,158,370	808,865
Standard and Mene Grande, Curacao	403,905	40,820
Total from Barcelona	2,500,540	2,072,800
Daily average	80,662	69,093
Grand total Venezuela	17,785,880	17,208,125
Daily average	573,738	573,604

Colombia . .

Petroleum-Export Curve Reaches 15-Month Peak

COLOMBIA's exports of crude oil for the first 7 months of this year were off about 10 per cent from 1940, but considerable encouragement was found in the fact that July 1941 exports were the highest since April 1940. Exports in July this year, augmented by record shipments to the United States, totaled 2,530,000 bbl., the highest since the 2,610,000-bbl. total of April 1940.

Comparative data on Colombian crude exports by months for the first 7 months of 1940 and 1941 follow:

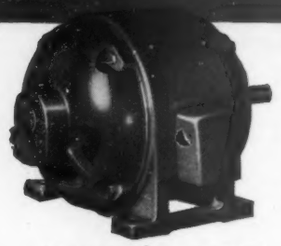
Month—	1941	1940
January	1,381,000	1,790,000
February	1,485,000	2,197,000
March	1,418,000	1,557,000
April	1,536,000	2,610,000
May	2,317,000	1,912,000
June	1,533,000	2,031,000
July	2,530,000	1,464,000
Total	12,200,000	13,561,000

China . .

Exploratory Work Succeeds In Three Inland Provinces

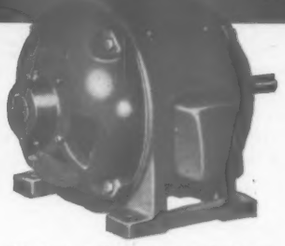
THE Chinese provinces of Shensi, Kansu and Szechwan have a small volume of crude production and recent drilling work by the National Resources Commission of the government has been encouraging, according to a Bureau of Mines report. Wells drilled in Kansu are producing at increasing rates. Oil is also believed to exist in Sikang and Sinkiang provinces.

TRI-CLAD* protection is now a *family affair!*



Tri-Clad Sleeve-bearing Polyphase Industrial Motor Is Most Widely Used

A well-protected, open motor for industry's general-purpose needs. Horizontally mounted—for direct-connected and belt drives—it is economical to operate.

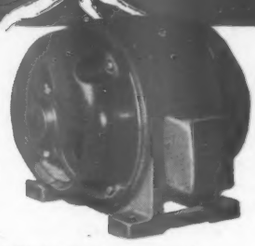


Tri-Clad Ball-Bearing Polyphase Motor

Has additional advantage of being mountable in other than horizontal positions. Will take end thrust—for example, from beveled-gear pinion. Similar to the sleeve-bearing motor and, like it, available in many types.

Tri-Clad Splashproof Ball-bearing Polyphase Motor

For use in wet surroundings, such as dairies, paper mills, canning factories, etc. Furnished with cast-iron, waterproof conduit box, deflecting endshields, and moisture-resistant insulation.

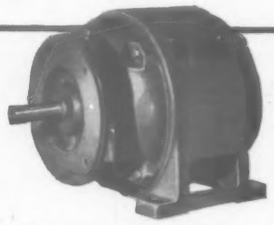


Tri-Clad Capacitor-Motor (in sleeve-bearing or ball-bearing types)

For single-phase operation. Available in types to drive such devices as compressors, pumps, fans, blowers. No radio interference; no brushes to wear; quiet in operation.

Tri-Clad Gear-Motor

For economical, compact, low-speed direct or pinion drive. Wide range of output speeds available. Open, splashproof, and capacitor-motor construction. Oil- and dust-tight housing reduces maintenance. Easy to mount.



Tri-Clad Ball-bearing Induction Motor, with Face-type End-shield Mounting

For close-coupled attachment to machine tools, compressors, pumps, etc. Motor bolted from driven machine. A few standard mounting dimensions apply to many ratings.

Tri-Clad Round-frame, Ball-bearing Induction Motor with Flange-type End-shield Mounting

For close coupling, for direct bolting to driven machine. Mounting dimensions are standard, but larger than those of motor at left.

Tri-Clad Vertical Motor

For general purpose fan, pump, and machine drives in vertical position. Both polyphase and capacitor-motors available with solid- and hollow-shafts and shielded construction with a variety of bases.

The improvements in Tri-Clad motor design are *fundamental* improvements, not just "sales features" to popularize a new model. That's why they are being extended, month by month, to a whole family of G-E integral-horsepower motors—both general-purpose and special types.

All these new members of the Tri-Clad family are the result of basic redesign to meet modern industrial conditions. Each has new performance and convenience features important to its particular field of service. For complete information on the right Tri-Clad motor for *your* application, consult our local office, or write General Electric, Schenectady, N. Y.

BUILT FOR PROTECTION FIRST . . . TO LAST

Today a wider range of your special needs can be filled by the growing Tri-Clad motor family. Every member offers extra strength and longer life because of these 3 "extras"

- ***Extra Protection*** AGAINST PHYSICAL DAMAGE. Cast-iron frame and end-shields.
- ***Extra Protection*** AGAINST ELECTRICAL BREAKDOWN. Stator windings of Formex wire.
- ***Extra Protection*** AGAINST OPERATING WEAR AND TEAR. New sleeve-bearing design.

In addition, you'll find the modifications to meet special requirements are soundly engineered to give you space-saving, time-saving, and money-saving advantages all down the line. Consult your G-E representative for Tri-Clad horsepower ratings now available.

*Reg. U. S. Patent Office.

GENERAL ELECTRIC

Refinery Expansion

Five Refineries Receive High Priorities Rating for Production of Aviation Fuel

WASHINGTON, D. C., Nov. 17.—High priority ratings for materials have been obtained on five additional plants which will produce either 100-octane aviation gasoline or the materials which go to make up this highly critical defense fuel, it was announced today by the Office of the Petroleum Coordinator.

This brings to a total of 20 the number of aviation-gasoline plants now building or soon to be commenced under the program to triple present refining capacity, now about 40,000 bbl. daily.

The plants announced today, location, and type are as follows: Shamrock Oil & Gas Co., Amarillo Tex., isobutane; Atlantic Refining Co., Philadelphia, Pa., 100-octane; Standard Oil Co. of California, Richmond, Calif., thermal-cracking unit; Union Oil Co., Los Angeles, Calif., polyform cracking unit; Standard Oil Co. of Ohio, Toledo, Ohio. isopentane.

Tetraethyl Lead Allocation Starts to Civilian Consumers

Proration of tetraethyl lead among civilian customers of Ethyl Gasoline Corp. was announced this week, confirming earlier indications that shortages of raw materials might force curtailment in consumption of the knock depressant which is essential to finished aviation motor fuel.

Announcement of the plan to allocate supplies of tetraethyl lead on the general basis of sales to each customer for the year beginning November 15, 1940, the Ethyl corporation said that exemptions would be made of defense business.

"We regret to advise," E. W. Webb, president of the corporation, said in wires to all customers November 17, "that on account of limitations placed by the Government on the supply of essential raw materials we have been obliged to curtail production to a point where some plan of equitable allocation of shipments to our customers has become necessary. Orders now in our hands will be filled. Future orders can be accepted, subject until further notice to the general principle of allocation to each customer on the basis of sales to him for the year beginning November 15, 1940, with provision for exemption of defense business and for necessary adjustments as explained in detail in letter being mailed to you, the equities of which we hope you will fully appreciate under prevailing conditions over which we have no control."

East Texas Refining Offices Closed After Skelly Merger

Offices of the East Texas Refining Co. at Dallas, Tex., will be closed the latter part of this month and all records will be transferred to Tulsa, headquarters of the Skelly Oil Co., which several months ago announced a merger of the two concerns.

Natural Gas

B. R. Bay Is Vice Chairman Of A.G.A. Natural Gas Section

B. R. Bay, president, Northern Natural Gas Co., Omaha, Neb., was elected vice chairman of the Natural Gas Section of the American Gas Association at its annual meeting in Atlantic City, N. J., recently.

Repressuring in Lopez Field Planned by Mills Bennett

Permission to start a repressuring operation in the Lopez field, Webb County, Texas, is being sought by Mills Bennett Production Co. Recently, the company outlined a plan before the Railroad Commission at Austin; Tex., by which it would use two wells, situated about 2 miles apart, for injection purposes.

The Lopez field was discovered in 1935, producing from the Mirando sand at 2,125-2,250 ft. Approximate pay thickness is 18 ft.

The field has produced approximately 10,000,000 bbl. of crude during the 6 years of its life and current recovery is at the rate of 1,200,000 to 1,300,000 bbl. annually. Initial pressure in the reservoir was 760 lb.

More than 75 per cent of the field's wells are now pumping.

Permit Granted for Woodbine Repressuring at Cayuga

Amerada Petroleum Co. was granted a permit last week by the Texas Railroad Commission to repressure the Woodbine sand in the Cayuga field of Anderson, Henderson and Freestone counties, Texas. Gas to be used will be taken from the Trinity or Glen Rose. The order provides that the repressuring shall not raise the bottom-hole pressure of the Woodbine at any point above its original pressure.

Natural Gasoline

Natural-Gasoline Production Increased, Stocks Decline

Production of natural gasoline increased to 188,810 bbl. daily in September, a gain of 6,905 bbl. over the average rate of manufacture in August, the Bureau of Mines reported last week. Louisiana and the Gulf Coast and Panhandle districts of Texas were the chief contributors to the higher rate of production.

Despite the rise in production, drafts on stocks continued in September. Manufacturers reported stocks of 5,373,000 bbl. at the end of September compared with 6,111,000 bbl. at the end of the previous month.

Production for the first 9 months this year totaled 46,177,000 bbl. against 40,749,000 bbl. for the same period in 1940. The details of production for September and August this year and for the first 9 months are shown in the following table:

	Production			
	Sept. 1941	Aug. 1941	Jan.-Sept. 1941	Jan.-Sept. 1940
East Coast				
Appalachian	6,302	5,930	64,818	58,037
Ill., Mich., Ky.	5,710	5,760	46,803	21,910
Oklahoma:	32,597	32,597	281,653	299,219
Oklahoma City	5,638	6,062	52,086	61,060
Osage County	5,579	5,059	42,430	39,439
Seminole	9,739	9,683	82,841	89,462
Rest of state	11,641	11,793	104,296	109,258
Kansas	5,586	5,330	52,389	46,707
Texas:	105,450	105,255	850,118	672,291
Gulf	27,686	27,239	208,252	132,926
East Texas	15,561	16,630	131,562	126,369
Panhandle	24,763	24,240	213,078	190,556
North Texas	2,299	2,208	20,027	33,871
West Central	4,850	4,857	44,289	46,211
Rest of state	30,291	30,081	232,910	142,358
Louisiana	22,070	20,345	110,067	83,423
Arkansas	2,890	2,908	25,859	23,497
Rocky Mountain	8,549	8,921	74,726	68,510
California:	48,734	49,792	432,959	437,864
Huntington Beach	2,804	2,926	23,746	23,886
Kettleman Hills	9,622	9,343	85,922	94,124
Long Beach	7,229	7,538	66,558	67,241
Santa Fe Springs	4,572	4,767	41,922	42,594
Ventura Ave.	4,643	4,881	42,533	47,870
Rest of state	19,864	20,337	172,278	162,149
Total	237,888	236,838	1,939,392	1,711,458
Daily average	7,930	7,640	7,104	6,246
Total (thousands of barrels)	5,664	5,639	46,176	40,749
Daily average	189	182	169	149

NATURAL-GAS GROUPS JOIN IN SOLVING TECHNICAL PROBLEMS . . .

Joint meetings of the technical men of the California Natural Gasoline Association and the Natural Gasoline Association of America were held in Los Angeles, Calif., to discuss mutual problems when the Pacific Coast group held its fall sessions. Officials of both associations indicate the strong possibility of joint technical standards resulting from cooperative studies which have been in progress for some time. Those attending included as shown in the picture, H. H. Beeson, Sabine Valley Gasoline Co., Inc., chairman N.G.A.A. technical committee; George L. Tyler, secretary, C.N.G.A.; Ray E. Miller, Hanlon-Buchanan, Inc., president, N.G.A.A.; W. C. Dayhuff, Standard Oil Co. of California, president, C.N.G.A.; W. W. Robinson, Texas Co., vice president, C.N.G.A.; William F. Lowe, secretary, N.G.A.A.; J. B. Taylor, Signal Oil & Gas Co., chairman, C.N.G.A. technical committee

Davies Urges Texas to Delay Additions to Oil Inventory

THE Texas Railroad Commission and other state regulatory bodies were asked this week to use established procedure in determining production allowables for December pending an early announcement by the OPC of a consistent and practical program for correlating petroleum stocks with production and consumpton. The request was made to Col. Ernest O. Thompson, chairman of the Railroad Commission, in a response to a letter the Texan had written to Harold L. Ickes, petroleum coordinator, in which expansion of the storage program was urged. Deputy Coordinator Davies replied:

"The subjects of maintaining a better and more definite relationship between petroleum production and consumption," Mr. Davies wired Colonel Thompson, "and of determining of proper function of petroleum inventories have for some time been receiving the serious attention of this office, and your letter of November 11 finds us fully cognizant of the production, stock and consumption situation which, however, needs further analysis to determine a policy adequate for the emergency.

"Because of the multiplicity of abnormal factors," the deputy coordinator continued, "which this emergency has added to the normal economic concepts which, as you know, have not been too clearly defined, we find it inadvisable, in advance of such analysis, to announce a long-term program for the consistent balancing of production and consumption by such stockpiling operations as may be necessary. Although some preliminary program might be quite adequate and effective with respect to Texas, because of its predominant position in the petroleum industry, you will realize that some emergency impact might cause the application of the same incomplete program to some other area where it would result in some severe economic dislocation."

Mr. Davies then asked for a continuance of the usual pattern in determining December allowables.

Colonel Thompson, who will be relieved of his military duties November 24, pointed out the reduction in petroleum stocks over the year and suggested that minimum crude stocks should be 306,000,000 bbl. and inventories of gasoline 103,000,000 bbl. throughout the emergency. Previously, at last week's meeting of the American Association of Oil Well Drilling Contractors at Dallas, Tex., Colonel Thompson had laid the predicate for his subsequent letter to the OPC.

●

Lessees Seeking Protection Against Defense Delays

Protection for lessees in the form of suspending the time element during delay caused by conditions of national defense has made its appearance in new lease forms covering land transactions in oil states.

One form of "if" clause reported reads:

"Notwithstanding any of the provisions hereof, if lessee, his heirs or assigns shall be prevented from beginning or continuing drilling operations by virtue of any order of the Railroad Commission of Texas, or any other governmental agency of the State of Texas or the United States of America having authority in such premises, or if the beginning or continuance of any such drilling operations is prevented by virtue of the inability of the lessee, his heirs or assigns to secure pipe or any other equipment as a result of any priorities order, or other such order of any official agency of the State of Texas or the United States of America, having authority in such premises, then for any such period all the obligations on the part of the lessee to be performed herein shall be during the time that any such continue suspended, and no part of such time shall be counted or assessed against the lessee, and any such time during which the lessee is prevented from performing his obligations herein contained by the said orders or rulings of any of the said governmental agencies shall not be a part of the time provided in this lease and shall not be counted, assessed or considered as such.

"It shall, however, be the obligation and duty of the lessee to use all reasonable diligence to secure the necessary proper orders for beginning and continuing drilling operations from any governmental agency having authority in the premises, and to use all reasonable diligence to secure pipe and other equipment under rulings of said governmental agencies having authority in the premises."

DEATHS

JOHN B. GRIEVES, 73, who is reputed to have sold a 240-acre oil lease for $1,500,000 in 1920 and bought it back in 1937 for $11,000, died in a Tulsa hospital last week. Death was due to a heart ailment. Mr. Grieves made his home in Bartlesville, Okla., where he had been active until recent weeks. His widow and a daughter survive.

WALTER M. MEIER, 56, Atlantic Refining Co., Dallas, Tex., died last week following several months of ill health. Mr. Meier was a member of the A.P.I., and formerly served as chairman of the Texas-Arkansas-Louisiana division of development and production, and also as secretary. The widow and eight children survive.

RAYMOND A. WAGONER, 54, oil man of Amarillo, Tex., died at his home there last week. He had been a resident of the Texas Panhandle for 25 years, and of Amarillo for 13 years. His widow and a daughter survive.

HARRY BRADEN PRICKETT, 44, oil operator of Midland, Tex., died last week at his home in Midland. He had been in ill health since early summer. His wife and two sons survive.

WILLIAM A. BLAKEMORE, chief civil engineer for Gulf Oil Corp., Houston, Tex., suffered a heart attack November 8 while a spectator at a football game and was dead upon arrival at a hospital.

E. T. PARKS, derrickman for Chansler-Canfield Midway Oil Co., was killed in an oil-field accident last week in the Rincon field, coastal Texas.

FRANK HORNE, 42, general superintendent for the Bareco Oil Co. refinery at Barnsdall, Okla., for the past 5 years, died last Saturday. His widow and two children survive. He had been ill for 3 weeks before his death.

●

Scouts Year Book Supply Almost Exhausted

J. W. Selby, president of the National Oil Scouts and Landmen's Association announced last week that copies of the association's annual year book are practically exhausted. The demand for the book has exceeded expectations due to the increase in memberships which at a recent date was 1,347. This is an increase of 250 over the past year, and is greater than any year since the inception of the association in 1923. Copies of previous year books published by the association can be obtained by writing to the association's headquarters, Box 1425, Austin, Tex. The executive committee of the association is scheduled to meet in December at Dallas to select the date and city for the next annual convention.

CALENDAR

December

EXPOSITION OF CHEMICAL INDUSTRIES, eighth annual meeting, Grand Central Palace, New York, December 1-6.

NEW MEXICO OIL AND GAS ASSOCIATION, Artesia, N. M., December 3.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, Southeastern district meeting, New Orleans, La., December 3-5.

PETROLEUM ELECTRIC POWER ASSOCIATION, Dallas, Tex., December 4-5.

OKLAHOMA STRIPPER WELL ASSOCIATION, Tulsa, December 5.

SOUTH DAKOTA INDEPENDENT OIL MEN'S ASSOCIATION, twenty-third annual convention, Aberdeen Civic Auditorium, Aberdeen, S. D., December 11.

January

SOCIETY OF AUTOMOTIVE ENGINEERS, annual meeting and engineering display, Book Cadillac Hotel, Detroit, Mich., January 12-16.

THE MARKETS*

CRUDE OIL: Revocation of the gesture to lift crude-oil prices in one area a week ago has not diminished strength of the general market. Indication of the levels to which crude purchasers have elevated their sights is given in December nominations submitted last week to the Railroad Commission. Texas buyers nominated 1,497,403 bbl. daily for December, an increase of 55,364 bbl. over the November total. Premiums are being offered by more buyers at more points than in previous recent weeks.

REFINERY PRODUCTS: Basic markets are unchanged. Tank-car sellers are showing a renewed interest in the East Coast spot market. Stocks of distillate fuel are relatively high and suppliers are a little more interested in moving material. Prices on packaged oils, chiefly lubricants, were advanced this week in the East Coast area to offset higher costs.

TANK WAGON AND POSTED DEALER: This market is without change. Distributors appear content to maintain their current positions until the policies of the Office of Price Administration are more clearly defined.

FINANCIAL: Oil stocks reacted last week after 3 weeks of continuous rise. Average of 30 representative stocks for week ended November 15: High, 26.89; low, 26.14; close, 26.50. Week ended November 8: High, 27.12; low, 26.39; close, 26.86.

*Detailed information in the market section.

Directional drilling under offshore water can be most economically done from a multiple location. The accompanying photograph shows five wells grouped together and surrounded by a concrete platform. The one servicing derrick is used for all of the wells, and is mounted on rollers which ride on tracks set in the concrete.

ENGINEERING & OPERATION

In This Section

NOVEMBER 20, 1941

Continental Points Way to New Louisiana Refinery

By W. T. ZIEGENHAIN

Months of concentrated planning are reflected in the design of the new Continental Oil Co. 10,000-bbl. refinery at Lake Charles, La. Diverging from the usual procedure this plant receives stabilized crude and casing-head gasoline separately through pipe lines to produce 65 per cent high-octane gasoline.

FROM every 42-gal. barrel of stabilized crude and accompanying liquefied petroleum gases processed through the Continental Oil Co.'s new 10,000-bbl. refinery at Lake Charles, La., 27 gal. of gasoline are recovered. This represents a 65 per cent yield and is probably a record among refineries throughout the world. This fact is doubly interesting because the normal blend of crudes coming to the plant contains only 11 gal. by natural distillation. The plant, of course, utilizes cracking and polymerization to a high degree.

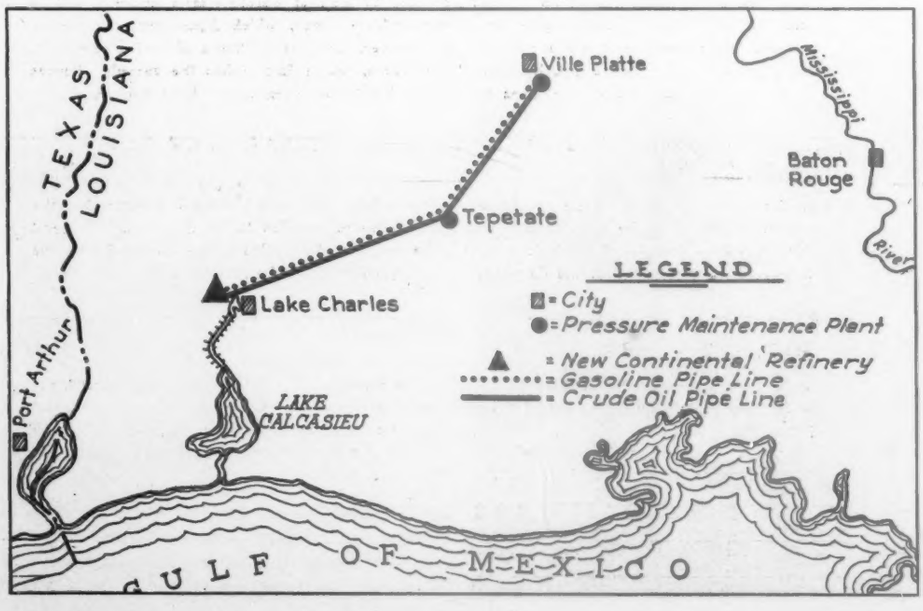
The plant is unique also because it produces gasoline of unusually high octane value. This large yield of high-octane motor fuel is accounted for by the unique manner in which the company has correlated its field crude-oil production practices and its refining operations. More specifically, Continental has combined in one interrelated operation the multiple-zone production of crude, its stabilization in the field, dual pipe-line transportation of the stabilized crude and the light casinghead fractions taken from it; thermal cracking, polymerization, alkylation and gas reversion.

The combination of these practices in the producing fields of Ville Platte and Tepetate, Louisiana, together with the elaborate refinery practices undertaken in the new plant at Westlake, near Lake Charles, La., represents a unique and balanced advance in petroleum conservation.

By stabilizing the crude in the field, the company conserves the natural formation pressures at the point of origin and then makes the most out of the hydrocarbons received by processing the fractions in the most economical and advantageous manner.

However, before discussing the refinery operation, it might be interesting to review the developments which led up to making this cycle of operations complete. The company first owned and operated a large tank farm near Lake Charles. Docks were provided there to service the tank farm and to provide a means for shipping crude to the company's refinery at Baltimore, Md.

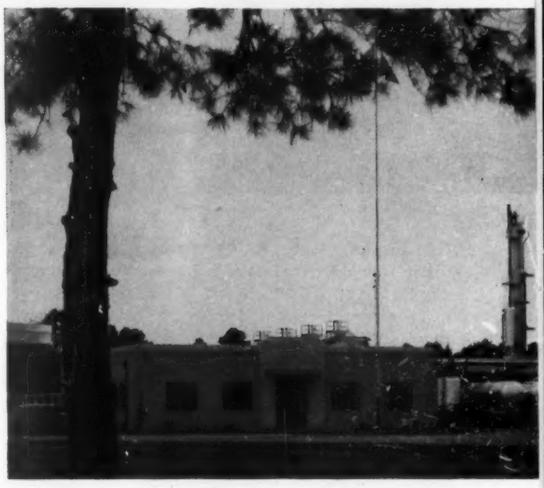
The discovery and development of oil production at Tepetate prompted the company to lay a crude line from this field to the Lake Charles terminal. This could have been the extent of the company's program but instead, Continental engineers viewed the situation from a much broader angle. They anticipated developing oil production at other points in southern Louisiana and they also recognized the advantages of re-



Top of pages: General view of new 10,000-bbl. Continental Oil Co. refinery at Lake Charles, La.

Pressure-maintenance plants are operated at Ville Platte and Tepetate. The stabilized crude and casinghead are moved by separate pipe lines to the new refinery at Lake Charles

to Future in Its



Exterior of refinery office and laboratory

turning the unused gas to the oil-producing formation in what they had termed a program of "pressure maintenance." Oil was discovered in large quantities at Ville Platte. The area soon proved more productive than Tepetate. Conditions there also favored returning the gas produced with the oil to the oil formation and the net result was the rapid development of the Ville Platte area and the installation of a large pressure maintenance plant there as well as at Tepetate. The two fields thus became the principal sources of crude moving from the company's terminal. Since a refinery was planned for Westlake and since substantial quantities of natural gasoline were recovered in each of these fields, a dual pipe line was laid from Ville Platte, through Tepetate to the refinery. One line was designed to carry the stabilized crude while the other was designed to transport the 70-lb. casinghead. Adequate and suitable tankage was provided for each.

The refinery which then was built presents an an unusual scene. Its compact distillation equipment and tankage are not visible through the trees until one reaches the plant site. For the plant, an area of 110 acres has been fenced in. Less than half of this is occupied by the refinery equipment and storage tanks in plant, however.

One travels the distance of two city blocks when going from the gatehouse to the refinery office and on either side of this roadway is a broad expanse of well-kept grass and trees.

Two Pipe Lines

As stated previously, the crude and casinghead are brought to the plant through separate systems. Each is introduced into the refining procedure to best utilize its particular properties and composition. The casinghead is stabilized to a raw product of 14-22 lb. vapor pressure, the nature of the production being determined by seasonal needs. The light fractions topped from the casinghead then mix with the vapors from the crude. The relationship between the volume of stabilized crude and casinghead processed is held uniform by means of the company's plant storage facilities. The volume of Ville Platte oil run compared with Tepetate crude is normally maintained in proportion to the rate of production in the two areas. However, over the summer every means have been taken to ship a maximum of the lighter crude to the Baltimore refinery and this has meant that the new Westlake plant has received a relatively high proportion of Tepetate oil. This was done because by shipping the lighter Ville Platte oil to Baltimore, a higher percentage of gasoline was transported to the eastern market. The practice thereby relieved somewhat the pressure of the limited tanker capacity available along the East Coast. Normally, the production of these two crudes is also affected by the relationship of the burner oil and gasoline demands on the East Coast. Therefore, at some periods of the year Baltimore will receive some Tepetate oil also.

Section of control laboratory

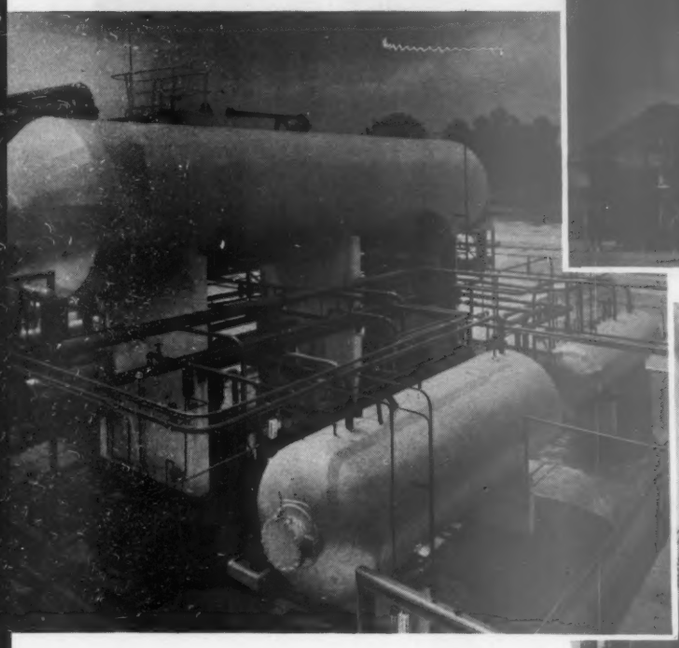
At the present time the refinery is processing approximately equal quantities of 35-gravity Tepetate and 40-gravity Ville Platte oils. It is running daily approximately 10,000 bbl. of this blend. In the field each of these crudes is produced along with a high volume of gas. If the crudes were not stabilized they would be approximately 3° higher in gravity. The stabilization process in the two pressure maintenance plants accounts for the production of about 3,000 bbl. of casinghead daily.

The blend of crude processed approximates 37.5 gravity, is almost free of sulfur and sulfur compounds and upon natural distillation will produce approximately 26 per cent of 400-end-point gasoline of 60-octane value.

The casinghead feed is composed largely of saturated hydrocarbons, while the vapors from the cracking operation are essentially olefinic, which for the purpose of polymerization and alkylation makes it necessary to closely fractionate the combined vapors. The initial separation occurs in the depropanizing tower.

Reference to the flow chart shows the stabilized crude receiving heat as it passes through four exchanger banks and one section of the combina-

Right: Topping, cracking and thermal-polymerisation heaters in foreground. Below: Reaction chamber, alkylation system



Storage tanks for light products. A 100,000-bbl. Hortonspheroid receives the finished casinghead made from the stabilizer overhead coming from the Ville Platte and Tepetate pressure-maintenance plants

tion furnace on its way to the crude tower. From this tower side streams of naphtha, No. 1 kerosene distillate and diesel oil are recovered. The overhead goes through a debutanizer to straightrun raw gasoline storage. The vapor fractions, taken from the liquefied gasoline, are retained in the system as part of the charge to the gas reversion and alkylation plants.

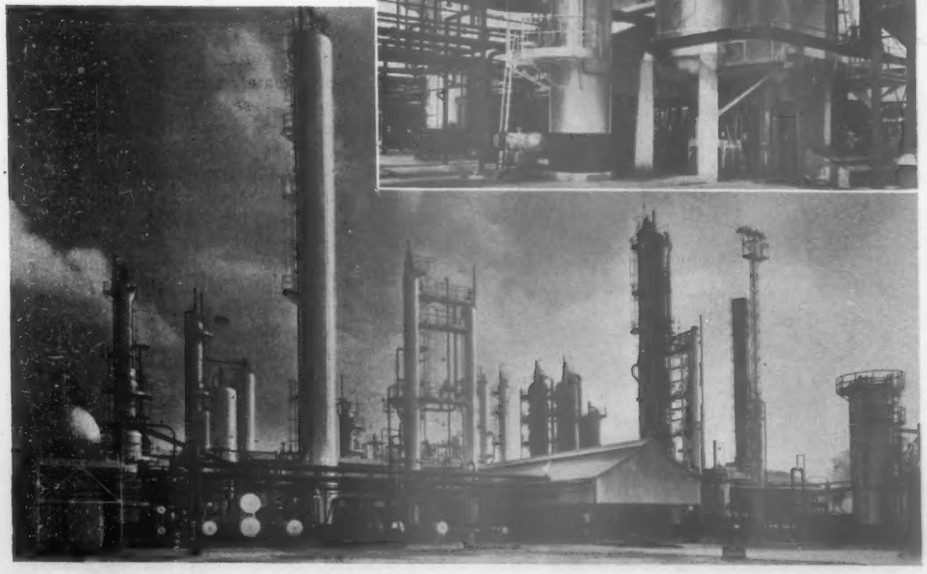
The reduced crude from the base of the crude tower is pumped to the evaporator, in which it is preheated and mixed with heavy recycle stock condensed from the transfer line vapors of the several cracking coils. This mixture constitutes the charge to the visbreaking coil. The evaporator bottoms products is marketable fuel oil.

The overhead vapors from the evaporator enter the bubble tower in which clean recycle stock is condensed and mixed with virgin gas oil from the crude-topping operation. Bubble-tower bottoms constitute charging stock to the gas-oil cracking coil of the combination furnace.

The manner in which the cracking stock and the light vapors from the various processes are further processed can better be seen in the accompanying flow chart. As a result of the combined operations of the units shown, the company is in a position to supply every need for motor fuels over the full range of present-day motor-fuel octane requirements. In addition, it is producing a substantial volume of light alkylate which is being stored as an aviation-gasoline component for future blending.

Right: Equipment for vapor-phase treatment of the gasoline by Gray process. The contact tower is shown in the center while the means for elevating and distributing the fresh earth is clearly shown in the equipment at the right

Below: Alkylation unit. Topping and cracking plant in center background. Portion of the main pump house in center foreground. Boiler house and water-treating plant at right

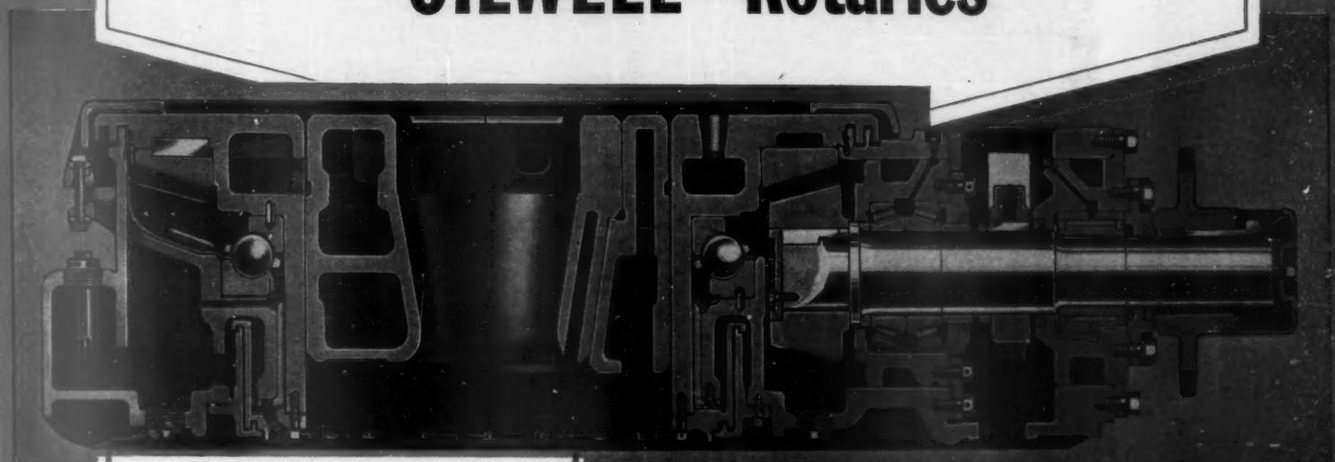


Other Facilities

On the company grounds are six water wells which liberally supply the plant with processing water. Three of these are 575 ft. deep while the other three are but 275 ft. deep. A unique feature of the plant layout is the design of the pump house, which is in the shape of the letter T. At the juncture of the two arms the company has located the control room, which is also unique as may be seen in the accompanying picture.

Steam power for the plant is provided by two 1,100-hp. boilers operating at 350-lb. pressure. At this pressure the steam is first supplied to the three charging pumps. These exhaust at 150 lb. and the steam is utilized in driving the circulating pumps, which exhaust at about 15 lb. pressure. This exhaust is then utilized as process

Here's why your driller prefers "OILWELL" Rotaries



Constant and Ample Lubrication

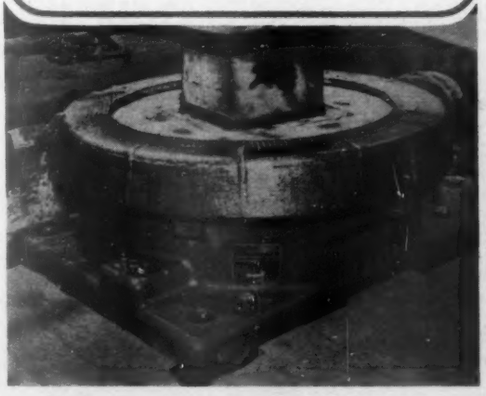
is the best assurance of long, efficient life. Illustrated in solid orange is the continuously circulating oilbath lubrication of the "Oilwell" 27½-A and 17½-inch Oilbath Rotaries. Oil picked up by the pinion and thrown from the gear is conducted by troughs in a steady stream to the main bearing. Part of the flow continues through the radial and hold-down bearing, keeping it constantly immersed in a shock-absorbing oil-cushion. Overlapping of the hold-down ring and oil-retainer ring insures complete return of the lubricant as it continues its circulating flow back to the reservoir.

Time-proved labyrinths at both the top and bottom effectively seal the oilbath enclosure and prevent intrusion of foreign matter. Shaded orange illustrates the separate lubrication of the pinion-shaft roller bearings in their sealed enclosures.

To maintain a constant oil pressure at the extreme speeds (up to 1000 r.p.m.) for which it is designed, the "Oilwell" 21-inch Super-Speed Rotary is provided, in addition to the splash system, with forced-feed lubrication throughout, including pinion shaft roller bearings.

* * *

"Oilwell" 17½-inch Oilbath Rotary.



In times of emergency, rotaries, like men, are counted on to stand up and render efficient, reliable service as long as the need exists. Performance records show that "Oilwell" Rotaries have what it takes in reserve capacity, durability and *lasting* efficiency. Here are some of the reasons for this performance:

★ **Ample Capacity**

	17½-inch Oilbath	21-inch Super-Speed	27½-A Oilbath
Rated Drilling Depth	7,500 ft.	17,000 ft.	17,000 ft.
Dead Load Capacity	200 tons	300 tons	300 tons
Max. Table Speed	400 r.p.m.	1,000 r.p.m.	400 r.p.m.

★ **Fully heat-treated, spiral-bevel gear and pinion with the pinion given an additional surface hardening.**

★ **High-speed, self-centering, angle-contact main bearing with large-diameter, high-precision balls and through-hardened and ground high-carbon, alloy-steel races.**

★ **Heavy-duty bronze radial and hold-down bearing.**

★ **Compact and sturdy unit-assembly of the fully heat-treated pinion shaft, its bearings, bearing housings and locking wheel.**

★ **Rigid cast-steel base with integral skids, table enclosure, and cylindrical supports for the pinion-shaft bearings.**

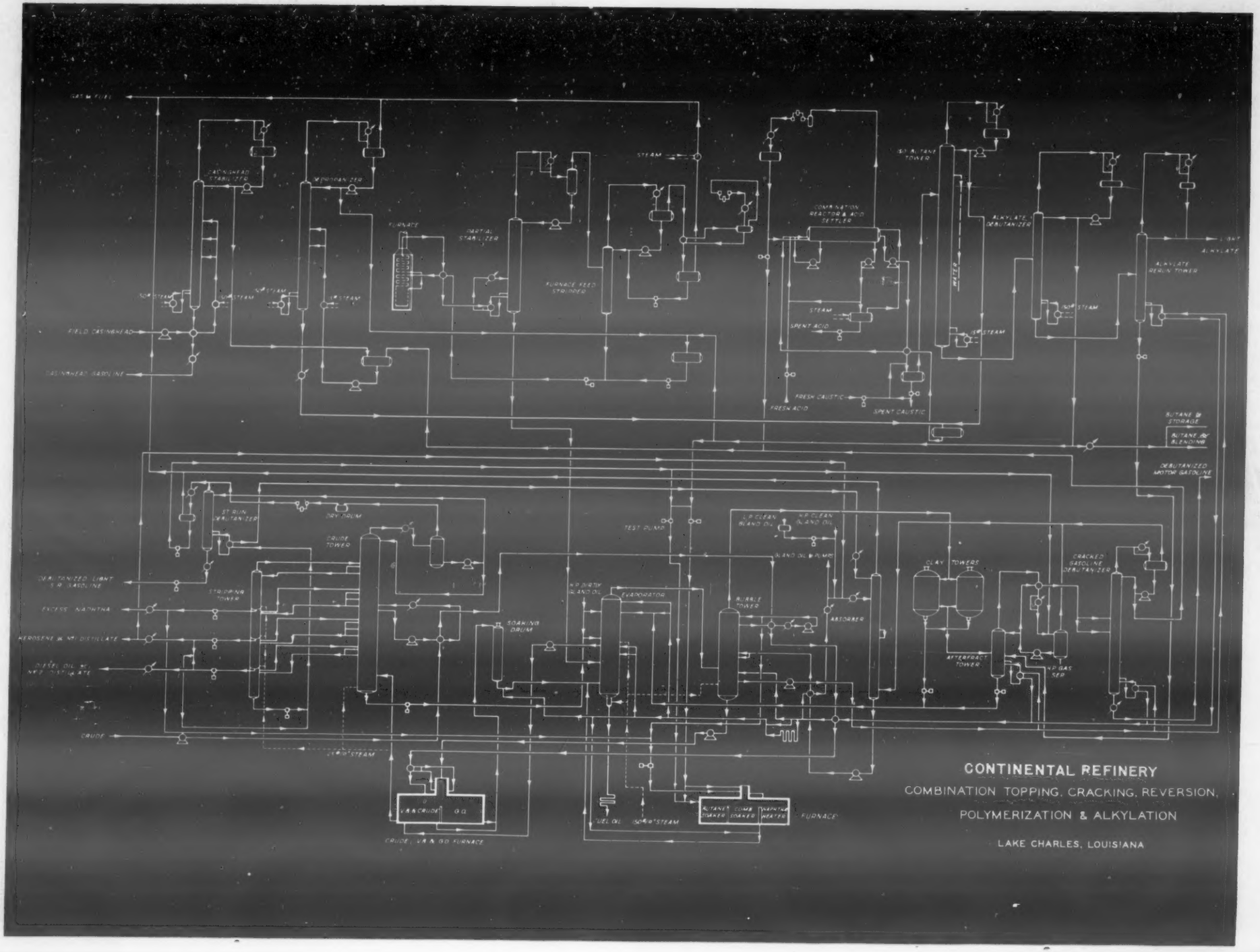
★ **Constant and ample lubrication — see illustration and description.**

OIL WELL SUPPLY COMPANY

EXECUTIVE OFFICE — DALLAS, TEXAS
DIVISION OFFICES — OIL CITY, PA.
DALLAS, TEXAS LOS ANGELES, CALIF.

Branch Stores Serving All Oil Fields
United States Steel Corporation Subsidiary

EXPORT DIVISION OFFICE —
30 ROCKEFELLER PLAZA
NEW YORK CITY

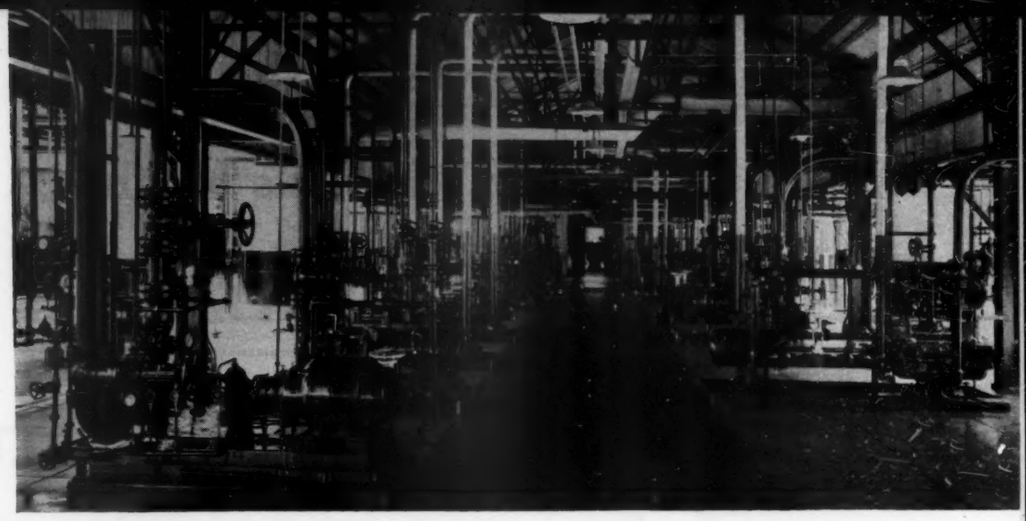

CONTINENTAL REFINERY
COMBINATION TOPPING, CRACKING, REVERSION,
POLYMERIZATION & ALKYLATION
LAKE CHARLES, LOUISIANA
CASINGHEAD STABILIZER
REFORMANZER
PARTIAL STABILIZER
FURNACE FEED STRIPPER
COMBINATION REACTOR & ACID SETTLER
ALKYLATE DEBUTANIZER
ALKYLATE REGEN. TOWER
ST. BUTANE TOWER
WATER
STEAM
SPENT ACID
FRESH ACID
FRESH CAUSTIC
SPENT CAUSTIC
FIELD CASINGHEAD
CASINGHEAD GASOLINE
FURNACE
CRUDE TOWER
ST. RUN DEBUTANIZER
DRY DRUM
STRIPPING TOWER
SOAKING DRUM
EVAPORATOR
BUBBLE TOWER
ABSORBER
TEST PUMP
L.P. CLEAN SLAND OIL
H.P. CLEAN SLAND OIL
SLAND OIL & PUMP
H.P. DIRTY SLAND OIL
CLAY TOWERS
CRACKED GASOLINE DEBUTANIZER
AFTERFRACT TOWER
H.P. GAS SEP.
DEBUTANIZED LIGHT S.R. GASOLINE
EXCESS NAPHTHA
KEROSENE & INT. DISTILLATE
DIESEL OIL & INT. DISTILLATE
CRUDE
V.R. & G.O.
FUEL OIL
BUTANE TO STORAGE
BUTANE TO ALKYLATE
DEBUTANIZED MOTOR GASOLINE
LIGHT ALKYLATE
FURNACE

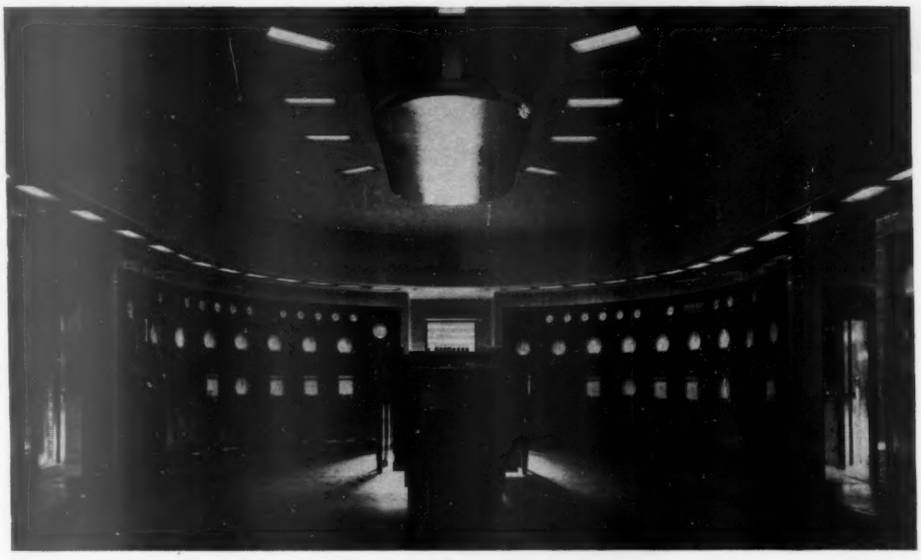
steam and of course the condensate is returned to the boilers.

Electric power is supplied by two 2,000-hp., 2,300-volt generators driven by condensing turbines.

The oil-treating equipment is rather simple inasmuch as the crudes contain relatively little sulfur. The cracked gasoline receives a caustic wash and then it is Perco treated. The straight-run gasoline, kerosene and diesel oil are doctor sweetened.

Another unique operation is the utilization of propane to cool the sulfuric acid during its reaction with the unsaturates in the alkylation unit. By this means a temperature of 41°-45° F. is maintained in the acid contact zone.





Above: North wing of pump house looking into control room. Left: Central control room for all major units

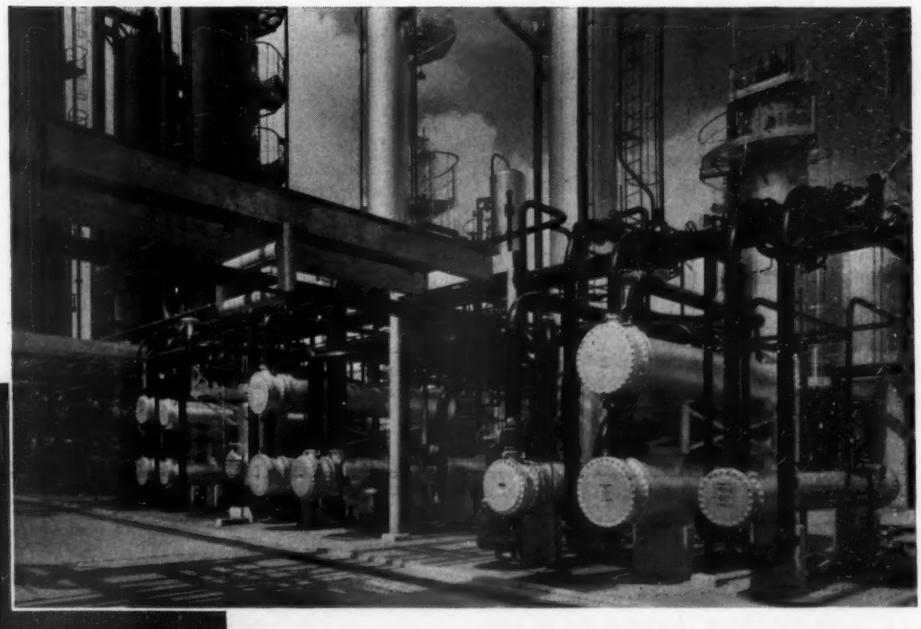
Another feature of the Continental Oil Co.'s new refinery setup is the picturesque colony of company houses located across the highway and in front of the refinery. It is composed of 16 units and is approached by curved roadways to give each house a broad front. Much of the natural beauty of the southern Louisiana vegetation has been retained along the borders of the colony and the unit presents not only a pleasing combination of colors but reflects an orderly quietness that is inviting to the refinery operator or to a visitor.

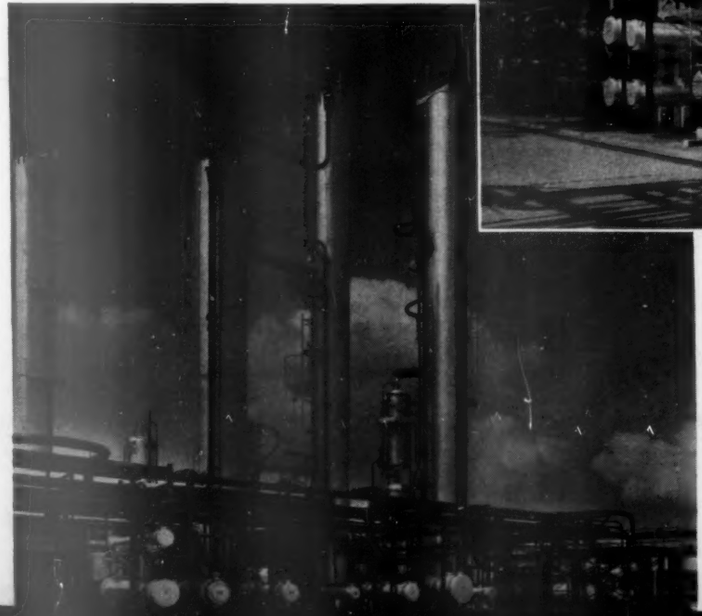
The plant, of course, is served by ample means for transporting its products. The greatest volume moves by water but an increasing quantity is moving by rail. Lines going to the terminal from the refinery are large. Cargo pumps are available which enable the plant to load 6,000 gal. of oil per minute. These are driven by 600-hp. electric motors.

In the rear of the plant, on the Kansas City & Southern Railroad lines, are 12 spots for loading 24 cars. Also, a marketing bulk plant, including butane tanks, is located on the highway in one section of the refinery grounds and trucks are serviced here.

The entire refinery was designed and constructed by the M. W. Kellogg Co. after months of detailed planning on the part of the Continental engineers and executives.

A visitor in the plant is especially impressed by the compactness of the individual units and the spacious avenues left between the lines of these units. It was a requirement of the basic design that aisles be left in all parts of the plant for the transporting of any supplies or equipment needed in the operation of that department. Therefore, sufficient room was left even in the aisles of the buildings for a large truck to drive right down through the maze of equipment on either side. At those points where heavy equipment might need be removed for repair, permanent overhead tracks and movable cranes have been supplied.





Above: Closeup of several exchanger banks. Note the accessibility

Left: Towers, (left to right) depentanizer on the alkylation unit, partial stabilizer, depropanizer and casing-head stabilizer

Critical Review of Methods for the Determination of the Porosity, Permeability and Saturation Of Core Samples

By M. D. TAYLOR
Shell Development Co., Emoryville, Calif.

SUMMARY

In view of the published methods of core analysis used for the determination of the porosity, permeability, and saturation of oil-field core samples it has become increasingly evident that the particular method to be adopted depends on the type of samples to be analyzed, the speed with which an individual result is required, the number of samples to be handled and the degree of accuracy needed. The methods of analysis which have been found most useful are briefly described and the conditions for which they are most adaptable are stated.

IN a review of the methods for core analysis which has been carried out during the past several years it has become increasingly evident that the particular method to be adopted must depend to a considerable extent on the type of samples to be tested, the number of analyses which are to be made, and the degree of accuracy required. In the discussion given below the methods which have been found to be most generally useful are described and the conditions for which they are most adaptable are stated.

Porosity Determinations

A. Methods in which the sample is not crushed.

In these methods the sample is extracted and dried, the bulk volume is determined either by the displacement of a liquid which does not penetrate the sample or by saturating the sample and displacing a liquid with the saturated sample, and either the grain volume is measured by the displacement of a gas or a liquid or the pore volume is measured by determining the amount of liquid necessary to saturate the sample. An alternative method of obtaining the grain volume which may be used for approximate work is simply to divide the dry weight of the sample by 2.68 since the density of the rock grains will very seldom deviate more than 3 to 5 per cent from this figure.

It is obvious that the per cent porosity may be calculated from these data using either of the two following relationships:

$$\% \text{ porosity} = 100 \frac{\text{Bulk volume} - \text{grain volume}}{\text{Bulk volume}}$$

or

$$\% \text{ porosity} = 100 \frac{\text{Pore volume}}{\text{Bulk volume}}$$

1. *Extraction and drying.*—A sample, preferably 10 to 20 cc. in bulk volume is broken from the core sample, and the surface is cleaned to remove traces of drilling mud, etc. The sample is extracted in a Soxhlet or other equivalent extraction apparatus using benzene, dioxane, or a gasoline fraction.* During this extraction the sample should be kept in an unglazed porcelain or paper thimble, covered with a plug of cotton or glass wool to avoid erosion of loosely cemented grains. After extraction the sample is dried in an oven at 105°-110° C., and cooled in a desiccator.

The time required for extraction may be appreciably decreased if the samples are presaturated with the extracting solvent. This presaturation may be accomplished by placing the samples in a suitable vessel, evacuating, covering the samples with solvent while evacuated, and releasing to atmospheric pressure.

2. *Bulk volume determination by displacement with a liquid which does not penetrate the sample.*—The bulk volume of the extracted and dry sample is determined by displacement with mercury. The method may be carried out by:

(*a*) Determination of the dry weight of the sample and the weight necessary to submerge it in mercury. The sample should be submerged with pointed steel rods and the weight required to submerge the rods to the same depth determined. The bulk volume is calculated by dividing the sum of the weights of the dry rock and the weight required to submerge the sample, less the weight required to submerge the rods, by the density of the mercury used.

(*b*) A steel or glass pycnometer having a cap which sits on a ground taper and which has a small hole drilled through the cap is filled with mercury, the cap is pressed into its seat and the excess mercury which overflows through hole in cap is collected and removed. The pycnometer is opened, the sample is placed on the surface of the mercury and submerged by a set of pointed rods which extend down from the lower side of the cap, and the cap is again pressed into its seat, which causes an amount of mercury equivalent to the bulk volume of the sample to overflow. The rods which submerge the sample should be adjusted so that the sample does not touch the sides of the pycnometer, to avoid trapping air bubbles. Either the volume of mercury which overflows or the loss of weight of the mercury in the pycnometer can then be measured and the bulk volume calculated.

(*c*) The displacement is measured by submerging the sample in mercury in any of several special types of apparatus and determining the rise in the mercury level either by electrical contacts or by hydrostatic connections which result in the movement of a less dense liquid in an inclined glass tube and thus magnifies the effect. These special types of apparatus are usually calibrated with steel balls or glass plugs of known volume.

Mercury Displacement Method

The determination of the bulk volume by mercury displacement is rapid and reasonably accurate under most conditions. The method cannot be applied to loosely cemented samples which lose grains when immersed in mercury, or to samples where only a small or an irregularly shaped piece is available due to the trapping of gas bubbles at the surface of the sample. The depth to which the sample is submerged should be kept small (less than 5 cm.) to avoid as much as possible the penetration of mercury into the pore spaces.

In general where a large number of routine analyses must be made per day and where the samples to be tested are well cemented and can be shaped to present smooth surfaces the use of a mercury-displacement method offers the most practical method of measuring bulk volumes.

3. *Bulk volume by submergence of a saturated sample.*—The sample is saturated with a suitable liquid, and the displacement of this liquid caused by the saturated sample is determined. The liquid used should have a low viscosity and should wet and penetrate the sample freely. Kerosene has been found to be entirely satisfactory for the purpose.* The extracted and dried sample is placed in a wide-mouthed bottle which is closed with a rubber stopper fitted with a two-way stopcock. One side of the stopcock is connected to a vacuum pump and the other to a funnel containing kerosene. The sample is evacuated and the stopcock is then turned to admit enough kerosene into the evacuated bottle to cover the sample, and then air is admitted to bring the pressure to atmospheric. (A number of samples can, of course, be saturated at the same time, by using a suitably large bottle.) After saturation the sample is removed with a forceps, the excess liquid which forms a drop at the bottom of the sample removed by touching the sample to a piece of filter paper or a paper towel, and the volume of kerosene displaced by the saturated sample determined in a wide-mouthed pycnometer.

This procedure for measuring bulk volume, al-

*Chloroform or carbon tetrachloride, although excellent solvents and possessing the advantage of noninflammability, are not recommended because of the possibility of hydrolysis resulting in the production of acids.

*Many other liquids, such as chloroform, tetra-chlorethane, etc., have been suggested for this purpose, but kerosene has been found to be equally satisfactory, and it is usually more available and less expensive.

though somewhat more time consuming than the mercury-displacement method, has the advantage that it can be applied to loosely cemented samples, and to samples with irregular surfaces. Since the liquid displaced is transparent it is easy to avoid trapped air bubbles. The removal of excess liquid after saturation, although requiring some care and practice, can be done to an accuracy of a few milligrams of kerosene. The method is the only one known with which the porosity of small core fragments or drill cuttings can be determined. With noncavernous samples reasonably accurate results have been obtained with core chips which averaged only 0.05 cc. per chip.

4. *Measurement of grain volume by gas displacement.*—The extracted and dried sample is placed in a steel cup which is filled with gas to a known pressure (usually 4 or 5 atmospheres). The gas in the cup is then expanded into a measuring burette to atmospheric pressure. By comparing the volume of gas obtained by expansion from the cup when the sample is present to that obtained in a duplicate determination with the sample removed the volume of gas displaced by the sample, i.e., the grain volume, may be calculated.

An apparatus which operates by this method is commercially available (so-called Bureau of Mines Porosimeter, or Boyle's Law Porosimeter[4]) and it can be highly recommended both for speed and accuracy. Since, however, there are alternate methods which are equally accurate and almost as rapid, the cost of this apparatus is probably not justified except for laboratories where a large number of samples must be tested daily.

5. *Measurement of grain volume by determination of the weight and the grain density.*—The extracted and dried sample is weighed, saturated with a liquid, and the apparent weight of the saturated sample while immersed in this liquid determined. The saturation may be carried out as described in Section A-3 above, and the apparent weight while immersed determined by suspending the sample from a balance arm by a fine wire. A small platform which is suspended from a balance arm by a fine wire and which is completely submerged in the liquid will facilitate the rapid handling of a number of samples. The grain volume is equal to the difference between the weight dry and the weight when saturated and submerged divided by the density of the liquid used.

Extremely Accurate Method

This method is capable of extreme accuracy and is as rapid as the gas method described above when a number of samples can be carried through the various steps as a group. The apparatus required, exclusive of the balance and vacuum pump (items which are usually required for other determinations as well as for this one) is simple and inexpensive.

6. *Measurement of the pore volume by liquid saturation.*—This procedure can suitably be employed in connection with the bulk volume measurement method described under A-3. It is simply necessary to weigh the dry sample before saturation with kerosene and the saturated sample after the excess kerosene has been removed but before the weight of kerosene displaced by the saturatd sample is determined. If the two methods are employed together it is not necessary to determine the density of the kerosene since the weight of kerosene contained in the saturated sample divided by the weight of kerosene displaced by the saturated sample and multiplied by 100 is equal to the per cent porosity.

B. Porosity determination in which sample is crushed.

The extraction and drying steps, which are necessary for the determination of the porosity when the sample is not crushed can be eliminated if crushing of the sample is permitted. The method is as follows: Break a suitable sample, preferably 10-15 cc., from the core, clean the surface of the sample to remove drilling mud, etc., measure the bulk volume by any of the procedures described above, crush the sample to its constituent grains, wash the grains with suitable solvents to remove oil and water (e.g. benzene, acetone, and pentane) and determine the volume of the grains. It is, of course, necessary to dry the rock grains before their volume can be determined; if the last solvent used is a volatile one, such as pentane the drying can be done very rapidly by subjecting the moist grains to a vacuum. The volume of the dry grains may be determined in a pycnometer with a suitable liquid, e.g. kerosene.

This method, although rapid in the sense that the porosity of a given sample may be obtained in an hour, whereas in the methods where extraction and drying are required the extraction step will usually require 20 hours or longer, the method in which the core is crushed is not well adapted to the determination of a large number of samples per day because of the many handling steps involved.

Permeability Measurement With Dry Air

The permeabilities ordinarily reported in core analysis refer to the permeability to dry air at about atmospheric pressure. The data required are the length and cross-sectional area of a sample, the rate of flow of dry air through the sample caused by the application of a known differential pressure across its length, and the viscosity of air at the temperature used. The sample used is usually cut from the core parallel to the bedding plane of the formation to be tested, with a diamond drill, which produces a cylindrical specimen about 2 cm. in diameter and 2 to 3 cm. long. The sample is extracted and dried as described in Section A-1, above. It is then mounted in such a way that the sides of the samples are sealed and a pressure differential can be applied across its length. For cylindrical samples this mounting can be quickly and conveniently accomplished by use of either a Fancher core holder[5] (in which the sample is inserted into a tapered soft rubber stopper which has had a smooth hole drilled through it slightly smaller than the diameter of the specimen under test, and the stopper is forced into a tapered metal holder which thus compresses the rubber around the sample) or a Hassler core holder[6] (in which the sample is slipped into a rubber tube and pressure applied to the outside of the tube in order to press it tightly against the core plug and seal the sides.) In case a cylindrical sample has not been cut it is usually necessary to mount the specimen by coating the sides with sealing wax (deKhotinsky cement, picein cement, or brewer's wax can also be used) and mounting it with wax in a suitable metal tube. After mounting the specimen a pressure differential is applied across its length with dry air and the rate of flow of air through the sample is measured. This rate of flow can be conveniently measured by use of a flowmeter in which the pressure drop is measured when the gas flows through a glass capillary tube. Such flowmeters are usually calibrated against a gas-collecting burette or a standard gas meter. If the rate of flow of air is measured at the exit end of the sample, and the inlet and outlet pressures are represented by P_1 and P_2, respectively, the average rate of flow of air in the sample is calculated from the formula:

$$Q_a = 2\,Q_o\,x\frac{P_2}{P_1 + P_2}$$

where Q_o is the observed rate of flow and Q_a is the average rate of flow.

The viscosity of air at the temperature of the experiment, t (in degrees C.), may be calculated from the relationship:

$$\mu = 0.01808 + 4.9 \times 10^{-5}\,(t - 20)$$

where μ is the viscosity in centipoises. This relationship is valid for temperatures between 10° and 50° C.

When a capillary or orifice flowmeter is used to measure the rate of gas flow and the temperature of the flowmeter is the same as that of the core sample, the temperature at which the flowmeter was calibrated, not the temperature of the experimental measurement, should be used in calculating the gas viscosity.

The permeability of the sample can then be calculated from the relationship:

$$k = \frac{Q_a\,\mu\,L}{(P_1 - P_2)A}$$

If Q_a is measured in cubic centimeters per second, μ in centipoises, the length of the sample, L, in centimeters, the average cross-sectional area of the sample A in square centimeters and the pressure differential $(P_1 + P_2)$ in atmospheres, the resulting permeability, k, will be obtained in darcys. If μ is measured in poises (1.0 poise = 100 centipoises) and $(P_1 - P_2)$ in dynes per square centimeter (1 atm. = 1.013×10^6 dynes/sq. cm.) and the rest of the quantities as before, the permeability will be obtained in square centimeters. Thus 1 sq. cm. is equivalent to 1.013×10^8 darcys or 1.013×10^{11} md.

In measuring the permeability the rate of flow used must be sufficiently low to avoid turbulent flow; this point should be checked by making a series of determinations with various flow rates and discarding the permeability values obtained at high rates if they are low as compared to the values obtained at lower flow rates.

As pointed out above the permeabilities ordinarily determined are made with dry air at about atmospheric pressure. These values are, however, somewhat higher than those obtained with gas at higher average pressures or with liquids. For specimens which do not contain materials which swell or shrink during extraction and drying, the permeabilities obtained by making a series of measurements with gas at various average pressures and extrapolating to infinite pressure are practically identical to those obtained with nonpolar liquids.[7]

The extraction step may be expedited by mounting the samples in a Fancher or a Hassler core holder and flushing them with suitable solvents (e.g., carbon tetrachloride, chloroform, or benzene) and drying. In this case the rubber mounting material should be replaced with buna rubber or neoprene.

Saturation Determinations

The methods for the determination of liquid saturation usually consist of analyzing the sample for water* and measuring the total loss of weight on extraction and drying. The quantity of oil present is then calculated by subtracting the weight of water found from the total loss in weight. The methods which can be recommended for this determination are as follows:

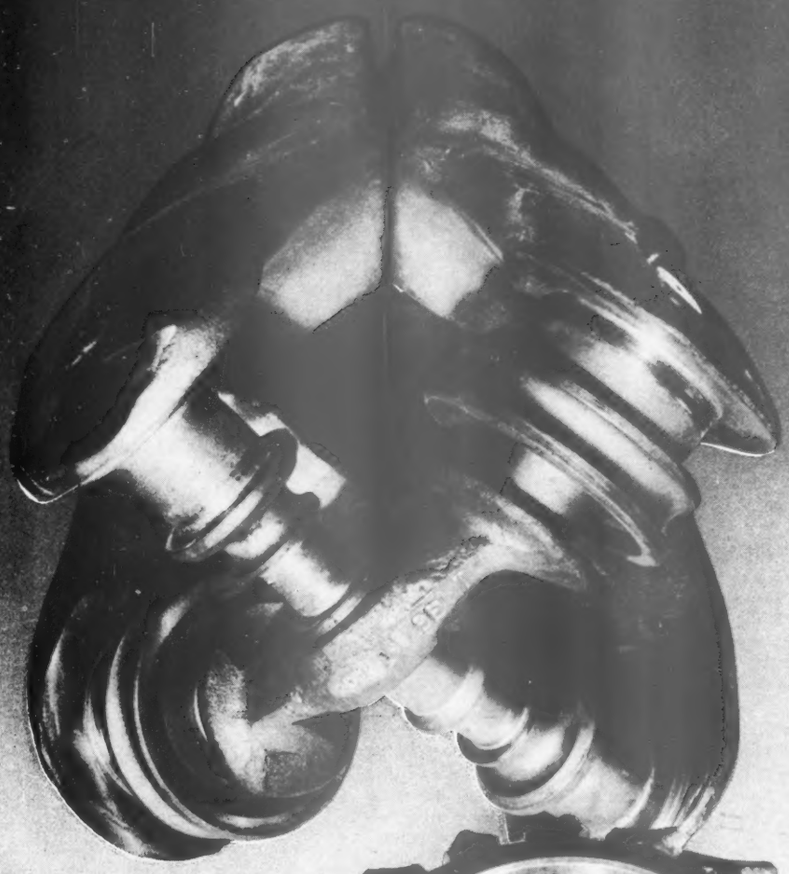
1. Water by distillation.[8]

This procedure (sometimes called the A.S.T.M. method or the Dean and Stark method) is carried out as follows: A sample (preferably 50-60 cc.) is broken from the central part of the core, transferred to a porous cup or extraction thimble, and weighed. The cup is then placed in a kettle containing a liquid hydrocarbon (xylene, toluene, or a gasoline fraction boiling at about 150° C.)

(Continued on Page 57)

*In calculating the brine saturation, the amount of water found should be corrected to formation conditions, i.e., due to increased temperature and the presence of salts the volume occupied underground will be larger than the volume measured in the laboratory.

Unitized for **GREATER STRENGTH**



THE CONSTRUCTION OF THE

REED "SE" ROCK BIT

provides a strong, safe foundation upon which to mount the side cutters and cross cutters. Each cutter is mounted upon an individual support, or quadrant, and the four quadrants unified to give to the entire assembly a strong, rugged structure.

The bridge is a brace and tie for the side cutters, preventing them from spreading apart or from crowding in and losing gauge. The cross cutter supports are trussed together at the bridge for greater strength.

This construction provides a greatly increased bearing support and with improved metallurgy in the cutters and cutter teeth assures greater footage per bit with Speed and Safety.

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SPEED-ECONOMY-DURABILITY

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ROCK BITS
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MORE HOLE PER BIT
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UNIFIED CONSTRUCTION OF INDEPENDENTLY SUPPORTED CUTTERS
•
GREATLY INCREASED BEARING SUPPORT FOR EACH CUTTER
•
IMPROVED NOZZLE ASSEMBLY FOR EFFICIENT CUTTER TOOTH CLEANING
•
CHOICE OF CUTTER ASSEMBLIES DESIGNED TO EFFICIENTLY DRILL SPECIFIC FORMATIONS
BIT COMPANY
HOUSTON, TEXAS

Refinery IDEAS

. . . that save $ $ $

Portable Threading Machine ↓

This portable threading machine below has been found to be a real convenience. The machine will thread pipe up to 2-in. diameter. Incidental tools are kept under lock and key in the chests behind the threading machine. The body of the outfit is an old truck chassis.

← Loosens Return Bends

The often difficult job of removing stuck return bends is simplified with this device. The key at the far end is set in the tube-turn lugs and the arm in the foreground is used to jerk the 40-lb. weight against the backing plate at the left. The weight is raised slightly in the area around the bar so that the impact is concentrated on the plate. A few jars are usually sufficient to remove the most stubborn bend. If rod breaks at key it is easily replaced.

Portable Work Bench ↑

This portable work bench, made from an old automobile chassis, is completely equipped. A vise and pipe rack are permanently fixed to the surface of the bench while chests around it are equipped with all necessary tools.

Test Tubes With Air ↑

Tube leaks are readily detected with this device. The plug at the left is inserted in one end of the tube while air is injected in the other through the tapered nipple extending from the "T" which also has a valve on one arm and a gage on the other. If there is any leakage, it is registered on the gage.

Clean Tube Turns ↓

This instrument was devised to facilitate the cleaning of tube turns. It consists of a knocker mounted on three universal joints which were filed down to permit the tool to make a complete turn. It is powered by an air turbine. Bolts through the lugs of the tube turn hold it in place in two short lengths of pipe flared at one end. These holders are bolted to a welded, steel table.

Operating Ideas

Cleaning Rest at Auxiliary Rathole

A sturdy backup post for the tongs used in making up the kelly to the joint of pipe standing in the auxiliary rat- or "mousehole" may be made to serve an additional purpose if the buffer post be made

sufficiently strong to support the weight of the pipe or kelly. A pin, or boss, affixed to the top of the stand serves to retain the pipe in place as it is lowered over it, holding it firmly while the threads are cleaned, checked and dope before being lowered into the hole.

Hoist for "Junk Box" Speeds Work

Loading, unloading and working with material in the usual "junk box" ordinarily is difficult because of the high sides and the manner in which the load becomes interlocked in transit. To provide easier handling of the heavy parts, one end of the box is equipped with a vertical mast or post of 4-in. pipe, some 42 in. in height. Into the open top of this mast is slipped the end of a short jib, support for its base being given by a half-coupling which spans nearly 180° of the post, and maintains the jib in proper alignment.

Knockout for Field Gas Supply to Boilers

Reduction of line pressures in the field line supplying fuel to the boilers of a drilling unit results in a sudden drop in temperature which, in turn, causes condensation of some of the gasified hydrocarbons being carried in the gas stream. To remove these slugs of fluid and prevent their being carried to the burners and there causing irregular firing and possible explosions, one drilling company installs a knockout between the reducing valve and the boiler-feed manifold.

All-Steel Welded Work Bench

A combination work bench and tool chest is made up of heavy pipe frame, with a flat work surface at one end of steel plate, and with a recessed section over the remainder. This recessed section serves for working on assembly or cleaning of such equipment as is composed of small parts which might become lost on a regular flat surface. A heavy sheet steel lid, flanged to fit closely within the recessed section, normally stands open, with a row or pins or slots into which the normal complement of tools in set.

BEFORE YOU

WITH THE NETWORK SYSTEM FAULTY FEEDERS ARE AUTOMATICALLY DISCONNECTED WITHOUT INTERRUPTING SERVICE

By using a double-throw primary switch with each transformer and arranging the primary feeders so that any transformer can be connected to either feeder, spare transformer capacity is held at a minimum. Half of the transformer capacity is normally connected to each feeder. When a transformer or feeder fault occurs, the faulty section is automatically disconnected without interrupting service.

WESTINGHOUSE

Westinghouse

Progress in METALS

By W. L. NELSON

Substitute Steels for National Emergency

THE layman and even the manufacturer of steel equipment often has firmly fixed in mind that only a particular alloy steel will serve for his purpose. Doubtless it is true that particular steels have proved to be somewhat superior to others for specific purposes, but also it is true that by minor changes in manufacturing operations substitute alloy steels can be found that will in many instances serve the purpose almost as well as the steels now employed.

An example is the use of alloy steels for the side-bars of heavy duty chains. The tabulation shown here, lists alloy steels that have been used at one time or another for this purpose. The heat treatments that are given in the tabulation are only approximate but they will serve as a starting point for determining the proper or exact heat-treating operations that must be developed in the shop.

Of the elements shown in the tabulation, carbon and molybdenum are the only two that are available in adequate amounts in the United States. Others however, such as nickel, vanadium and tungsten are available to the United States regardless of how the European war may develop, except that time will be required to expand the capacities of the mines and to arrange transportation. The elements chromium and manganese are of definite strategic importance because chromium is normally imported from Turkey, Southern Rhodesia, New Caledonia, South Africa, Yugoslavia, Cuba, Greece and the Philippine Islands, and manganese is brought from the U.S.S.R., the African Gold Coast, Cuba, India, and Brazil. Although sources for these two elements (chromium and manganese) can probably be developed close to or in the United States, such a program would involve years of effort.

Thus, among the steels indicated in the tabulation, only the carbon steel is immediately available and only the nickel and molybdenum steels (Numbers 1 and 5) will be available in the near future. Even with these steels, the manganese content still presents a difficulty. Fortunately, however, large stocks of manganese have been accumulated, and a relativly small amount of manganese is required for these and nearly all common steels.

Although only a small amount of steel is required for chain sidebars, much the same situation exists with regard to all alloy steel parts that are used primarily because of their strength or shock resistance. Thus, the same general situation embraces nearly all services except those that involve extreme corrosion conditions or extreme temperatures. Examples of applications that involve much the same service as outlined above, are—base sections, fluid ends, worm housings, bearing-box covers, etc., of pumps; crankshafts, connecting rods, cylinder heads, crosshead guides and pins, studs, valve bodies and seats, and cylinder liners; connecting pins, bushings, cotters and rollers of chains; rotary pinions, swivels, shafting and gears of rotary tables; sprockets, clutch bands, shafting, etc., of drilling hoists; parts of crown and traveling blocks; drill collars, tool joints, drill pipe and casing; bodies, cutters, pins, bits, reamers, fishing tools and core bits; and many, many others.

Attention, Steel Fabricators

READERS of The Oil and Gas Journal will wish to assist in the conservation of alloy steel scrap by segregating and saving scrap metal in the form of turnings, cuttings, scrap, edge pieces, etc., so that it can be returned to the steel mills or scrap dealers. The following letter from the Office of Production Management is reproduced for your consideration:

"Due to the requirements of the defense program, the indicated demand for such alloying elements as nickel, chromium, molybdenum, etc., is considerably in excess of the current supply. While facilities for the production of these elements are being expanded, it is essential that all possible sources of supply be explored and developed.

"Since these elements are reclaimable, an important source of supply is the scrap being produced daily by users of these alloys.

"The urgency and importance to the defense program of the enclosed questionnaire is obvious. These questionnaires are being mailed to purchasing agents for distribution to the proper plant officials.

"In cases of companies operating more than one plant, questionnaires are being sent in duplicate to each plant known to be a substantial user of these alloys. Separate returns should be made for each plant. Duplicate copy may be returned for record. Additional copies will be furnished on request. R. C. ALLEN, Deputy Chief,

"Iron and Steel Branch in Charge of Raw Materials."

The questionnaire referred to in the letter may be obtained by writing to R. C. Allen, Room 4065, Social Security Building, Washington, D. C., asking for the questionnaire form entitled, Survey of Alloy Steel Scrap.

Scrap Dealers

Last month at the OPM meeting for scrap dealers, it was reported that next year about 25 per cent of the steel output will come from reclaimed steel scrap; copper scrap will constitute about 34 per cent of the copper supply; and 22 per cent of aluminum production and 20 per cent of lead production will be reclaimed from scrap.

Reports indicate that the collection of scrap is not as much of a problem as is the task of moving it toward defense production once it has accumulated. Heretofore the indecisive steps taken in setting up scrap price ceilings and priorities slowed the distribution process almost to a standstill.

The widely heralded aluminum drive was a prime example of the indecisive action. After about 14 million pounds of pots, pans, bicycles, etc., were accumulated, complications arose in disposing of the aluminum scrap. Although arrangements were made by Mayor LaGuardia to sell direct to smelters at 11.5 cents per pound, the smelters refused to buy after they discovered that only part of the material was aluminum, and that much of the aluminum was of a low-grade variety which was too high in iron for most purposes. Finally the aluminum scrap was sold to secondary smelters for manufacture into a high-iron mixture that is used for killing steel.

Welding Terms

Weld, Filler, Base, etc., Metal

The material which is being welded or cut is referred to as the base metal or parent metal. Metal which has been added by welding is called deposited metal. The added metal may also be referred to as filler metal. The resultant fusion of base metal and filler metal is in general called the weld metal.

The metal expelled from a joint made by the resistance welding process is referred to as the flash or fin.

COMPOSITION, HEAT TREATMENT, AND PROPERTIES OF VARIOUS ALLOY-STEELS THAT HAVE BEEN USED FOR SIDE BARS FOR CHAINS

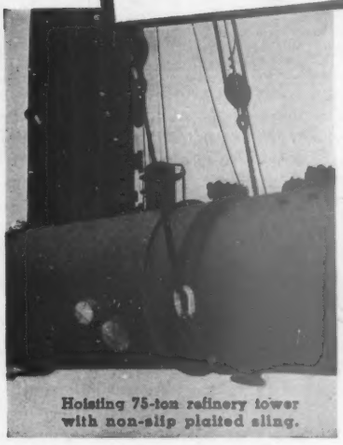
No.	S.A.E. No.	Tensile strength (lb./sq.in.)	Elongation, % in 2 in.	Brinell hardness	Heat treatment: Oil quench (°F.)	Heat treatment: Temp. (°F.)	Approximate composition, per cent: Carbon	Nickel	Chromium	Molybdenum	Vanadium	Manganese
1	2345	100,000	25	225	1,425	1,350	0.45	3.50	....	....	....	0.65
2	3045	100,000	24	230	1,500	1,350	0.45	0.65	0.65	....	....	0.85
3	3140	110,000	24	220	1,525	1,325	0.40	1.25	0.60	....	....	0.65
4	4135	115,000	26	225	1,575	1,325	0.35	....	0.65	0.25	....	0.65
5	4640	115,000	22	235	1,525	1,200	0.40	1.75	....	0.25	....	0.50
6	5140	100,000	23	210	1,500	1,300	0.40	....	0.95	....	....	0.75
7	6135	105,000	23	230	1,600	1,300	0.35	....	0.95	....	0.18	0.45
8	1040	95,000	23	200	1,525	1,200	0.40	....	....	....	....	0.65

Easy to Answer!

Question: What is the safe, quick, economical way to handle a load that is

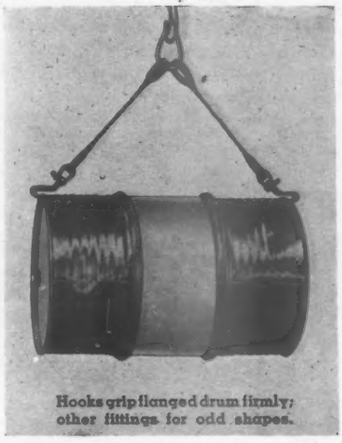
HEAVY... like a big refinery tower?
IRREGULAR... like a casting?
SLIPPERY... like a stack of pipe?
UNWIELDY... like a drum or barrel?

See Answer Below



Hoisting 75-ton refinery tower with non-slip plaited sling.

Slick, sliding pipes can be easily balanced and stacked.



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Drill-Pipe and Tool-Joint Troubles—Their Causes and Prevention

By R. S. GRANT and H. G. TEXTER
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This is the third and final installment of an article that started in the November 6 issue. The article is a slightly abbreviated version of a paper that was presented at the annual meeting of the American Petroleum Institute at San Francisco, Calif., November 3-7, 1941.

DURING the makeup and breakout of tool-joint pin and box connections, very high compressive loads often occur on the flanks of the threads. Therefore, unless a good quality of thread lubricant is used, galling is likely to result due to breakdown of the lubricating film under these high loads. Many excellent lubricants have been compounded especially for this purpose, the most satisfactory being those containing finely powdered metals or metal oxides such as zinc or red lead mixture with high-quality greases. The powdered materials provide some protection against galling, even though the pressures involved may be so high as to result in breakdown of the grease film.

Very good results also have been obtained with the use of special lubricants containing, in addition to powdered red lead, a relatively soft, easily compressed filler of rather coarse particle size, such as cottonseed meal, sifted to pass through a 12-mesh screen. This coarse filler becomes tightly compressed in the threads when they are screwed together and, therefore, provides an effective sealing action in the threads which is not provided in the case of many other lubricants commonly used on tool-joint threads. This material has been found to be very effective as a gall preventive even under high loads, and there is also some evidence to indicate that it assists in preventing the joints from "vibrating" loose while in service.

As additional protection against galling of threads and shoulders, the lubricant should never be allowed to become contaminated with sand, drilling mud, or other abrasive material—and the connections themselves should be cleaned well and adequately lubricated. In applying the lubricant, care should be taken to see that it is applied to the full length of threads and to the shoulders as well. Rotation of the pin in the box during makeup should not be depended upon to distribute the lubricant in the connection. A radial-bristle brush similar to a bottle brush has been found satisfactory for applying the lubricant to tool-joint threads.

Keep Lubricant Clean

(2-c) *High-speed makeup.*—It is common practice to make up tool-joint connections with a spinning line, which often develops high rotational speeds. Generally this practice does not cause trouble on old or worn joints; but if used with new joints, where the thread fit is much tighter and the thread surfaces have not become work-hardened, it frequently results in "burned" or galled threads. For the first two or three round trips it is safer to tong the joints by hand, and then cathead them up tight in the rotary, rather than to use the spinning line, as the danger of galling thereby is reduced.

(2-d) *Forced makeup of threads improperly engaged.*—When the tool-joint pin is stabbed into the box, the crests of the pin threads frequently land opposite the crests of the box threads, thus resulting in a jamming or wedging of the pin in the box. If the pin is rotated forcibly in the box in the makeup direction under these conditions, damage to the crest of the threads is almost certain to result. This damage is apt to cause a seriously galled connection.

In the event that this jamming or wedging occurs, it is advisable either carefully to rotate the joint backwards until the threads become properly engaged or to lift the stand and rotate it slightly, then lower it into the box—taking care to see that the threads become properly engaged before attempting to make them up.

(2-e) *Use of worn or damaged kelly sub.*—Inasmuch as the kelly sub is made up into every tool-joint box in the string, as hole is drilled, it is particularly important that this item of equipment be kept in good condition at all times. Use of a badly worn or damaged kelly sub may result in damage to many or all of the boxes in the string, and this damage in several cases has been the cause of subsequent galling or "freezing" of tool-joint pins and boxes.

(2-f) *Hardness of material.*—The first heat-treated tool joints were manufactured within a hardness range which was considerably wider than that in current use by most manufacturers. These wider limits permitted the use of harder, and also softer, joints than are in general use at this time. It was found through years of experience that galling was more prevalent in the softer joints, whereas breakage occurred more frequently in the harder joints. Thus, present hardness limits were established by selecting the range of hardness wherein minimum failures of both types occurred. Present methods of controlled heat treatment and close inspection insure a product of uniform hardness at definite control points established by the manufacturers. Furthermore, inasmuch as the hardness usually can be checked accurately on a damaged joint as well as on a new joint, any question on this point can be settled readily.

3. Wabble failures.

Failures in tool-joint pins and boxes due to wabbling are the result of operation of the connections while loose. These failures developed with changes which were made in drilling practices in order to drill straighter hole.

Analyzing the major changes which have been made to accomplish this, we find that they are—in large part at least—in the direction of reducing the torque and making conditions more favorable for the setting up of transverse vibrations in the drill stem.

In the earlier days of rotary drilling, the use of heavy drilling-weight plain-bearing rock bits and a large percentage of fishtail or drag-type bits developed rather high torque in the drill stem. This torque was sufficient so that any joints not actually tight quickly could be made up, and the weight had a tendency to cause the pipe to "spiral" in the hole and thus contact the wall. Contact between the pipe and the wall of the hole serves to prevent the occurrence of transverse vibrations in the drill stem, which have a tendency to cause the joints to work loose.

The change to light drilling weight, and the increased use of drill collars to supply the weight, both increase the length of pipe which is operated in tension. This condition is favorable for the setting up of transverse vibrations in the drill stem because the pipe does not have the same tendency to "spiral" in the hole, but is free to "whip" as it rotates. Also, it seems reasonable to assume that pipe held in tension does not contact the wall of the hole as forcibly as would pipe under compression, in straight hole at least. This would result in a reduction in the friction of the pipe against the wall of the hole and, consequently, a reduction in torque required to rotate the drill stem.

A further reduction of torque has resulted from use of antifriction bearings in rock bits and a general reduction in the use of fishtail or drag-type bits. The lower the torque in the drill stem, the less tendency there is to tighten loose joints or to help keep others tight.

Increased tendency of the joints to leak, particularly in view of the increase in pump pressure accompanying increased rates of circulation and the greater depth of wells, has resulted from reduction in mud viscosity. Also, although the effect may be slight, lighter-viscosity mud has less damping effect on vibration of the pipe in the hole than would mud of higher viscosity.

Higher rotary speeds tend to increase the vibration or whipping of the pipe in the hole, especially if the speed used happens to be critical for the particular conditions involved.

Antifriction Bearings

(3-a) *Leaky joints "dry" or "muddy" pins and "washouts."*—The earliest indication of wabble-type failures developing in a string of joints is the appearance of "dry" or "muddy" pins. Loose joints naturally are not pressuretight; therefore, mud works into the connections and displaces the thread lubricant, thus accounting for the "dry" or "muddy" appearance of the pins when the connection is unscrewed.

Leakage resulting from loose joints often develops into badly "mud-cut" joints or "washouts."

(3-b) *Lapped or worn threads and shoulders.*—When mud cutting is not serious, the threads and shoulders often become worn very rapidly as a result of a lapping action, which is set up as the pin wabbles in the box. The shoulders become lapped or worn to the point where they develop a definite crown, wherein high spots usually are found at two points diametrically opposite. These two high spots act as the fulcrum or axis about which wabbling occurs. Maximum

wear on the threads occurs on the pressure flanks at an angle of 90° with the axis of wabble, as shown in Fig. 14, while minimum wear occurs along the axis of wabble as shown in Fig. 15.

(3-c) *Broken threads.*—As this wabbling operation continues, the threads directly below the axis of wabble often fail in fatigue, due to repeated bending back and forth during each cycle of rotation. If the joint is unscrewed at this stage, galled threads frequently occur due to interference of these broken threads, coupled with inadequate lubrication resulting from leakage through the connection.

(3-d) *Broken pins and boxes.*—The wabbling action also sets up severe stress alternations in the pins and boxes, which alternations often result in forming of fatigue cracks—the cracks usually originating at the root of the threads near the large-diameter end. In extreme cases complete fracture of the pin or box will occur.

No changes in design of tool-joint connections have been found which will prevent failures of this type. It has been found, however, that they can be prevented by the exercise of care in tightening the joints as they are run into the hole, provided sufficient care also is exercised in handling the pipe to avoid damage to the pin and box shoulders.

A tensile load on tool-joint connections such as that due to the weight of drill stem held in suspension below the connection during drilling results in stretching of the pin. This, in turn, results in separation of the pin and box shoulders unless the joint has been tightened sufficiently to produce an initial compression load between the pin and box shoulders in excess of this weight.

Degree of Tightness

The degree of tightness required has been found to depend largely upon the drilling conditions. When rock bits are used with heavy drilling weight and slow rotary speeds, or when drag bits are being run, a moderate degree of care in catheading the joints up tight is sufficient. On the other hand, when most of the digging is with anti-friction-bearing rock bits and light drilling weight, extreme care must be taken to buck every joint up tight when going into the hole. Even after taking these precautions, there is some hazard that the joints may loosen during drilling.

The amount of force required to break the joints apart when coming out of the hole provides a fairly good check of whether they previously were made up sufficiently tight. If they break apart easily, they should be bucked up tighter the next time they are made up, or failures are apt to occur. It is good practice to use at least one wrap of the jerk line on the cathead for each inch of nominal pipe size when tightening tool-joint pin and box connections. Thus, three wraps should be used for 3½-in. pipe, four wraps for 4½-in. pipe, etc.

When "dry" or "muddy" pins are found in the string, steps should be taken immediately to correct the trouble. If caught in the early stages, joints which have been wabbling usually can be repaired on the rig by dressing off the shoulders with files until the shoulders are flat. A small, hand-operated dressing tool containing short files, as shown in Fig. 16, has been found satisfactory for this purpose. Fig. 16 also shows a ring gage for checking flatness of the shoulders, which ring gage should be used in connection with the shoulder dressing tool. Unless the shoulders are flat and free from bruises, fins, scores, galls, etc., it is impossible to obtain a uniform bearing around the full circumference, regardless of how tightly the joint is tonged.

A uniform shoulder bearing is essential to prevent stress concentration, leakage, and wabbling. Therefore, the condition of the shoulders should be watched, and care should be exercised in handling the pipe to avoid striking the box shoulder with the end of the pin during stabbing or on the rebound when the pin is jumped out of the box with a spring hook. Protection also should be afforded the shoulders, during movements of the pipe, by the use of sturdy protectors.

When a "dry" or "muddy" pin is found, there is often a tendency to switch the dry pin to an undamaged box and put a good pin into the damaged box, in the hope that this will correct the trouble. Instead, however, this procedure usually results in further damage to two joints instead of one—and, thus, if the practice is continued, the trouble quicky may spread throughout the whole string.

4. Wear on the outer surface of tool joints.

Wear on the outer surface of tool joints has been present since the first joints were used. During the earlier days of rotary drilling, however, the tool joints and the drill pipe generally became worn out at about the same time and, therefore, no particular problem as regards salvage of one or the other was involved.

It is believed that this was due, in part at least, to drilling practices in effect at that time. Most of the pipe was run in compression, which caused it to "spiral" in the hole and thus contact the wall with considerable force. This naturally would result in greater wear on the outer surface of the pipe than occurs with present drilling conditions under which most of the pipe is operated in tension.

Inasmuch as the wall thickness of drill pipe is small as compared with that of tool-joint sections, a given amount of radial wear will result in weakening the drill pipe by a greater percentage than it will the tool joint. Thus it can be seen that, in the event appreciable wear occurs on the drill pipe, the life of the drill pipe is likely to be reduced to the point where the tool joint and the drill pipe wear out at about the same time, as was the case formerly.

On the other hand, it seems reasonable to assume that, if the pipe is operated in tension, its contact with the wall of the hole during drilling not only will be lessened considerably, but the contact pressure also will be lower. Both of these factors would be expected to reduce the wear on the outer surface of the pipe and, therefore, other conditions being equal, should result in increased service life. Also, it should be remembered that the most commonly used tool joints have a considerably larger outside diameter than that of the drill pipe—which results in a reduction of hole clearance at the tool joints. Therefore, it would be expected that transverse vibrations in the drill stem might result in greater contact between the wall of the hole and the tool joints than would occur between the wall of the hole and the drill pipe. This naturally would increase the wear on the tool joints and decrease it on the drill pipe.

In this connection, two other changes made during recent years probably also have been responsible for much of the increased wear on tool joints, viz.: the reduction in size of the hole drilled, and the introduction of the internal-flush type of tool joint.

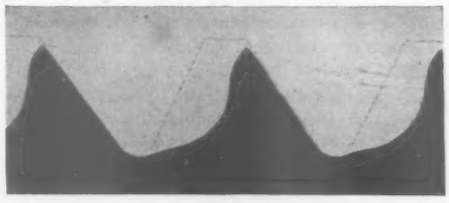
Two Important Changes

As both of these changes are in the direction of reducing the clearance between the wall of the hole and the tool joint, it is unfortunate indeed that they should have occurred at the same time. The internal-flush tool joint, as the name implies, was designed to eliminate the restriction in bore of the drill stem at the tool joints. In order to maintain reasonable strength of the joint it was necessary to increase the outside diameter, with resulting sacrifice in hole clearance as well as increased projection of the tool joint over the pipe—both of which generally increase the rate of wear on the tool joints.

The internal-flush type of joints was intended primarily for use where the softer formations were to be drilled, thus requiring large volumes of flushing fluid for efficient operation, and where wear on the outer surface of tool joints is not generally a serious problem. However, their use has been extended to some of the more abrasive territories where mud volume is not so important to rate of penetration, but where tool-joint wear is much more severe. Under these conditions, the use of this type of joint has not proved economical, and there is at this time a definite trend towards the use of smaller-bore joints even in some of the less abrasive territories.

It has been observed that the hardness and abrasiveness of the formation being drilled not only affect the rate of wear on the tool joints, but also materially affect the shape or contour of

(Continued on Page 53)



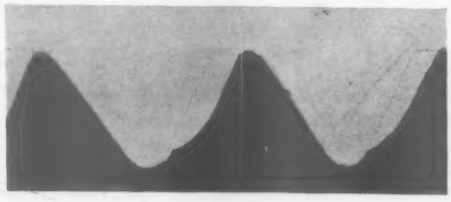


Fig. 14 (top) — Showing maximum wear on pressure flanks of tool-joint threads at 90° to the axis of wabble

Fig. 15 (above)—Showing minimum wear on pressure flanks of tool-joint threads in line with the axis of wabble

Fig. 16 (right)—Tool-joint shoulder dressing tool and flatness test gage

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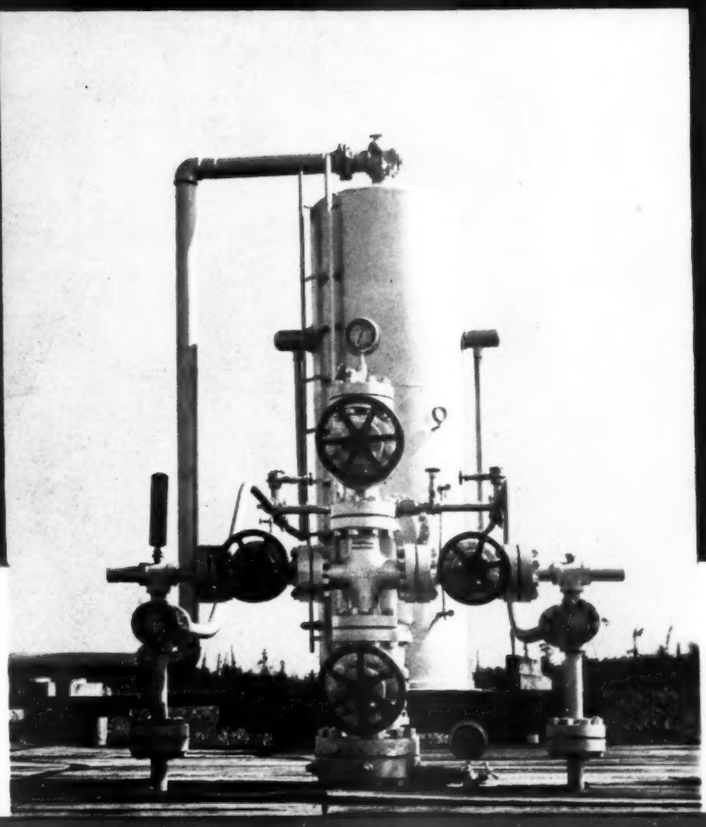

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WELL LOGS and FIELD DATA . . . . of Prospective Oil Areas

North Section Permian Basin—West Texas

(Compiled by The Oil and Gas Journal)

LOCATION: The north section of the Permian basin comprises an area of some 20,000 sq. miles lying between the productive part of the basin in West Texas and New Mexico and the Panhandle gas and oil field.

GEOLOGICAL HISTORY: The geological history of the region is obscure, owing to the fact that few wells have been drilled in it and correlations between those that have been drilled are difficult. Possibly the simplest method of attacking the problems of northern West Texas geology is by way of an understanding of the whole basin from western Kansas to the Mexican Border.

The basement on which the basin rests consists of granite and schists of pre-Cambrian age and was submerged below sea level at different times. The principal advances of the sea came from four directions, through the Anadarko basin of western Oklahoma and Kansas, from the north into the Julesburg basin of eastern Colorado, from the east over the present Bend arch and the Edwards Plateau region and from the southwest by way of Mexico. During the early Paleozoic, the southern and eastern parts of the area were covered by the Ellenburger-Arbuckle and Simpson seas, but the northward extent of these deposits is not known. Based on present knowledge, they do not appear to have covered the northern part of the basin. Silurian and Devonian deposits came in from the southwest and are also found in Kansas, where they are known as the Hunton lime. Mississippian and Pennsylvanian deposits cover the margins of the basin but do not appear to have extended as far to the north as did the Ordovician beds.

Then, in the Permian the Kansas end of the basin was mainly above sea level while the Texas section received a great thickness of limestone deposits. However, eventually, the sea retreated from the area and continental deposits were laid down so that there is no record of any Mesozoic or later marine deposits except in the Edwards Plateau region.

The Permian sea did not cover the area uniformly for long periods of time and even when parts of the basin were not submerged beneath the sea the basin feature persisted and great deposits of salt, anhydrite and gypsum were laid down together with much detrital matter from the limestone ridges which traversed the area. Thick salt deposits denote the evaporation of large bodies of water; the solid matter in a cubic mile of sea water would cover a square mile to a depth of about 180 ft. Thus, the formation of 2,000-3,000 ft. of evaporites would require the evaporation of a body of water from 10 to 15 miles deep, which obviously could not have existed in this area, nor could such evaporation take place.

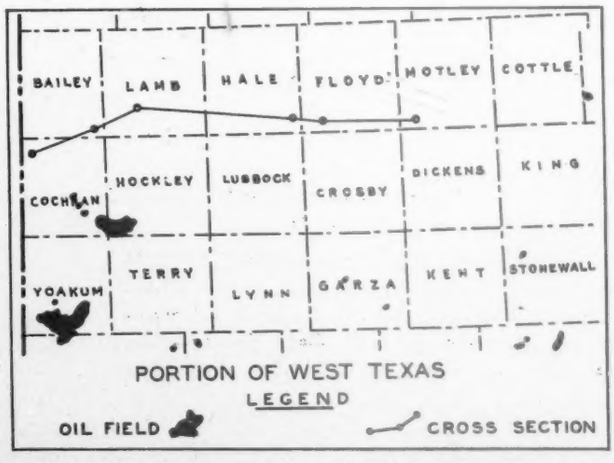
The most logical theory requires the existence of some sort of barrier between the basin of evaporation and the sea. Water passing over this barrier evaporates and loses its solids, while in the sea outside normal life processes are carried on. This sort of action is taking place today in the Gulf of Kara-Bughas on the east side of the Caspian Sea.

In the Permian basin, the barriers appear to have been reefs of limestone analogous to the limestone mass of El Capitan and these reefs have produced the greater part of the oil of West Texas. Sediments washed off these reefs and consisting of impure limy sands flank the limestone highs in many places, particularly in the Ward and Winkler County fields of Texas and Lea County, New Mexico.

At times the sea retreated from all or a part of the area, giving rise to anhydrite, gypsum and salt deposits in the thick limestone series and also to porous zones which may contain oil as in the deeper pays in Crane County and in the Wasson field.

The north West Texas area is the section where alternations of marine and evaporite deposits are most frequent, which not only adds to the number of possible pay horizons but also to the difficulty of finding commercial deposits or of locating them in the geological section when they are found. The pays at Wasson and Slaughter are generally considered to be of San Andres age, but wells drilled farther in the basin find the equivalents of these limestones to be a complex mixture of red beds, anhydrite and salt. The latest reported discovery of oil, near Lubbock, gets its production from a lime believed to be Clear Fork in age, which is also the age of the producing horizon in the Panhandle and is older than the San Andres.

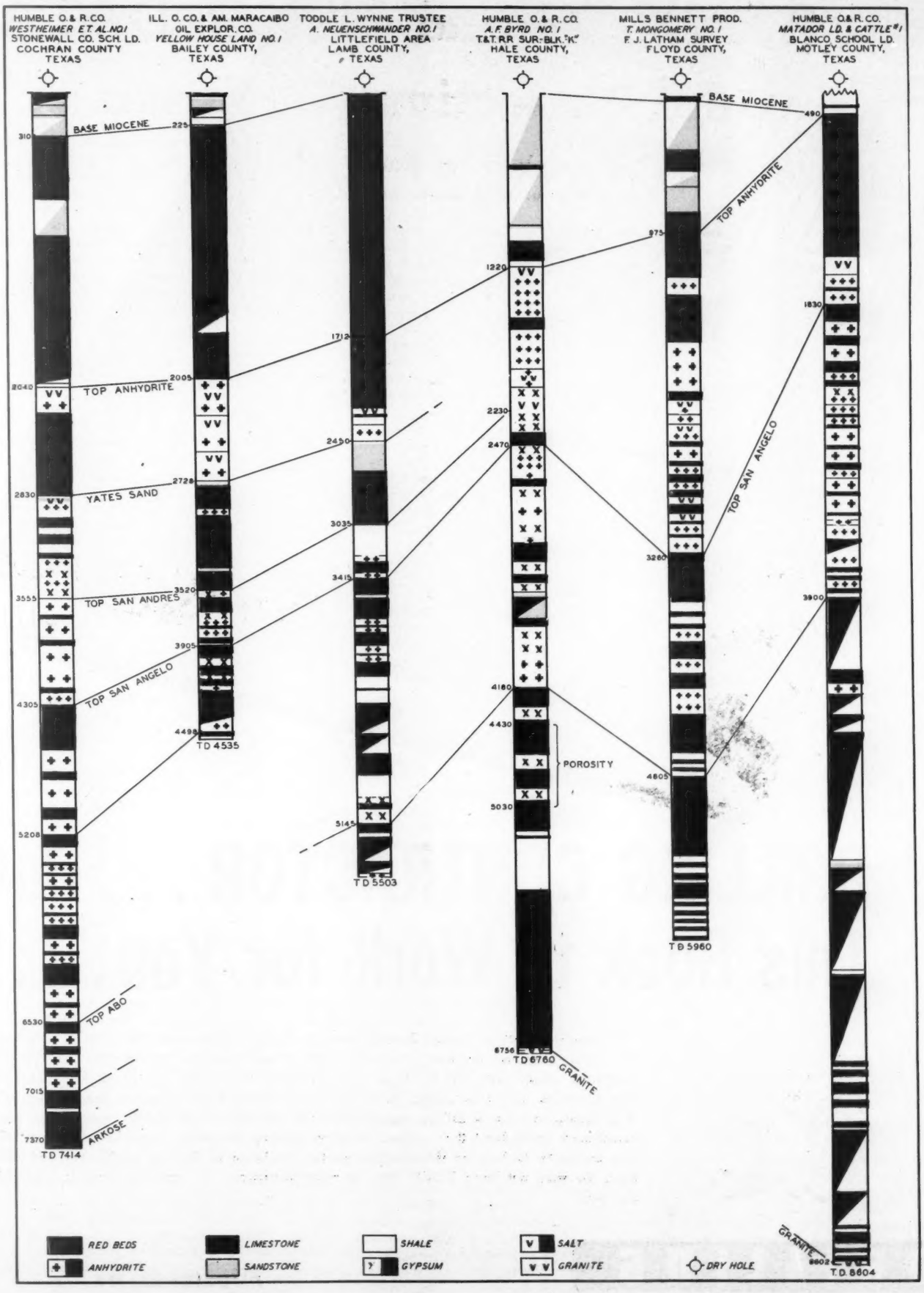
In this section also, the Permian appears to rest directly on the granite, as in the Panhandle.



Oil-field map of northern West Texas showing location of cross-section

POSSIBILITIES: Possibilities for production appear to be of several types. The massive limestone deposits of the older West Texas producing district appear to be missing and there also appears to be little likelihood of pre-Permian production. The multiplicity of anhydrite and salt deposits denotes an equal multiplicity of barriers with the possibility of finding oil and gas on the seaward side of these barriers. Localized sections of normal marine sediments deposited during temporary invasions of the sea may also yield production just as the Yates sand has done in the older regions. Granite highs with marine sections flanking them may also be considered a definite possibility.

Production in the pays which now produce in the Slaughter field and in Garza County appears to have little chance of extending into this area as the limestone pays in these fields grade into nonproductive formations. The thick limy section below the Permian in the eastern part of the section suggests that production from Foard County may extend into the area. The geology of the district differs so widely from that of adjoining areas that an entirely new system of correlating formations would seem preferable to attempts to extend names now used into it.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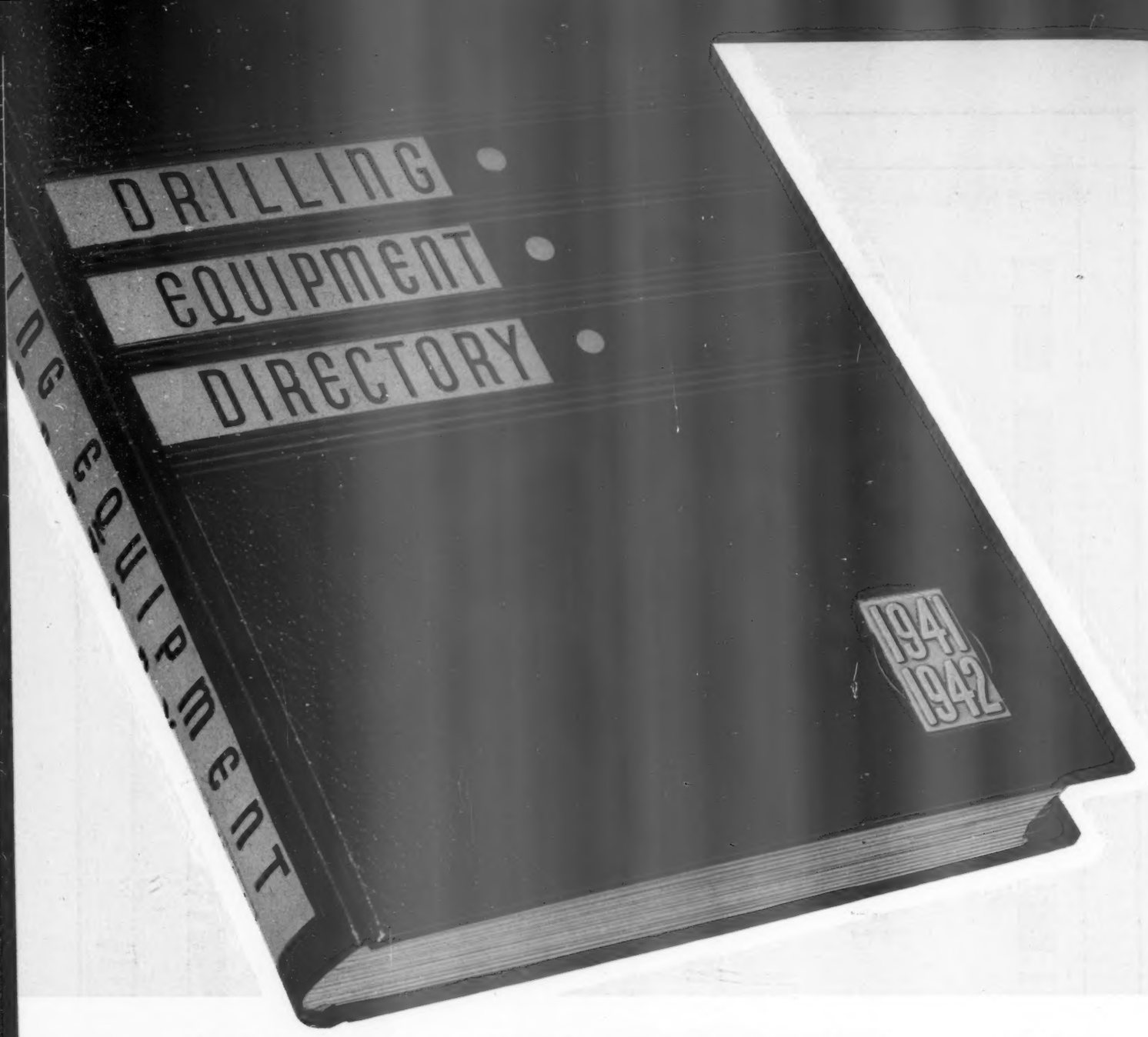

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Drill-Pipe and Tool-Joint Troubles

(Coming from Page 52)

the worn surface. The softer formations usually produce "barrel-shaped" wear on tool joints. Tool joints used in drilling the harder formations usually wear more nearly cylindrical, and in numerous instances it has been observed that the lower end of the tool joints becomes battered to such an extent as to result in a rather heavy peening or upsetting at the elevator shoulder. It is believed that this battering and upsetting is caused by the tool joints hitting against the wall of the hole as a result of transverse vibrations or whip in the drill stem (see Fig. 6 in drill-pipe section of this paper).

It is difficult to explain the difference in shape of wear on tool joints in hard and soft formations. Some are of the opinion that "barrel-shaped" wear is due to erosion produced by the flow of mud and cuttings past the tool joints, and is more pronounced in the softer formations because of increased velocity resulting from higher rates of circulation. Others think that wear from this action is negligible, and are of the opinion that the tool joints tend to "ream" the hole to some extent, and in doing so they become partly imbedded in the wall of the hole. The softer formations being more easily "reamed" than the harder formations allows the joints to become more deeply imbedded in the wall of the hole—thus resulting in greater concentration of wear at the ends of the joint, particularly the lower or the advancing end.

"Barrel-shaped" wear would be expected to result also from rotation of tool joints in a "key seat" or during the formation of a key seat in the hole. As "key seats" are believed to be more prevalent in soft-formation territories, this may be a plausible explanation.

Eccentric Wear

Quite frequently tool joints become worn eccentrically or wear excessively on one side of the joint. In the majority of cases wear of this type can be traced to the use of crooked pipe which causes a "crank" action in the hole, thus constantly presenting the same side of the joint to the wall of the hole and resulting in concentrated wear on that side.

However, in a few cases, eccentric wear has been experienced when the pipe was found to be quite straight.

As stated in the drill-pipe section of this paper, it is believed that this may be due to certain combinations of rotational speed and centrifugal "throw" which result in the same side of the tool joints (and pipe) rubbing continuously against the wall of the hole. Possibly the whole string is rotating, not as a straight line, but as a long spiral, in which one side (the inside of the spiral) is not touching the hole at all. The rather unexplainable part of this theory is why repeated trips in and out of the hole do not change the "throw" as to present different sides of the tool joints to wear—and thus produce approximately concentric wear. However, the actual facts support the general theory.

In the majority of cases the best assurance of preventing eccentric wear on tool joints is to avoid the operation of crooked pipe.

The necessity for making replacements of tool joints on drill pipe due to wear on the outer surface of the joints has proved very costly to the operators, and much work has been done to reduce this cost. The most practical methods which have been developed up to this time are:

A. *The use of oversize tool joints.*—In some of the less abrasive territories where the average drill-pipe life is only slightly longer than that of the tool joints, a relatively small increase in the outside diameter will increase the life of the tool joints to equal that of the drill pipe, and thus eliminate the necessity of making replacements. When this can be done, it is obviously the most economical solution to the problem. In the more abrasive territories, however, where it is not uncommon to require two to three sets of tool joints per string of pipe, this method alone does not solve the problem completely. Also, the benefits to be derived by this method are limited by the amount of increase in diameter which is practical and at the same time maintain sufficient hole clearance for satisfactory operation and to permit the use of fishing tools, washover pipe, etc.

B. *Development of shrunk-on tool joints.*—In recent years much work has been done to improve threaded connections between tool joints and drill pipe for the purpose of eliminating failures in the pipe at the last-engaged thread as well as for the purpose of simplifying the procedure connected with the installation of the tool joints on the pipe. As a result, tool joints which can be shrunk onto the pipe have been developed, thus eliminating the necessity of bucking on equipment for this work. As this method has simplified the equipment required for making original tool-joint installations, it is also possible to make replacements of worn joints at the rig with comparatively little expense to the operator. This type of tool joint, therefore, has met with considerable success in reducing the expense resulting from wear on the outer surface of tool joints.

C. *The use of wear subs between the tool joints.* Various types of wear subs have been tried, viz. double-pin, double-box, or pin-and-box types. Of these, the double-box sub has a definite advantage over the others in that, for a given length of wearing surface, the over-all length of the sub is a minimum and, therefore, the cost is a minimum. The cost of the tool joints is the same regardless of the type of sub used; therefore, the over-all cost is a minimum when double-pin tool joints are used with double-box wear subs.

Wear subs usually are made oversize on the outside diameter in order to provide additional protection to the tool joints as well as to increase the life of the subs themselves. Here again, as in the case of the use of oversize tool joints, the benefits to be derived are limited by the maximum diameter which it is practical to use. The principal advantage to this method lies in the extreme ease of making replacements. No special equipment is required, and replacements can be made on the rig, while pipe is being run, as worn joints appear in the string.

Installing New Wear Subs

When new wear subs are installed in a string of used drill stem, the diameter of the subs, of course, will be larger than the tool-joint diameter; therefore, it is very important that the tool-joint shoulders be checked carefully for the presence of fins, bruises, galls, or any other defect which may prevent a uniform bearing between the shoulders and thus result in leaky connections or wabble failures.

Various methods have been devised for rebuilding the outer surface of wear subs when they become worn. The most commonly used of these methods are building up the outer surface with an arc-weld deposit, and by the application of strips or sleeves, shrunk on or shrunk on and welded. Although these methods have resulted in increased life of the subs, they have proved to be rather expensive, and in some cases considerable difficulty has been encountered due to warpage and distortion of the threads resulting from the welding heat. Also, in cases of eccentric wear, some difficulty has resulted from the sleeves or strips wearing through on one side and splitting or tearing off. Due to the lower cost of double-box wear subs, however, it is more economical, when they become worn to replace them with new subs, than it is to attempt to rebuild the outer surface. These rebuilding methods have been tried also on the tool joints themselves with about the same results.

D. *The use of hard-surfaced tool joints.*—The ultimate aim of hard-surfacing the outer surface of tool joints is to increase the resistance of the joints to wear to the point where they will last the full life of the drill pipe and thus eliminate the expense of making replacements. Although this procedure has resulted in definitely increased life of tool joints, the ultimate aim by no means has been accomplished fully, particularly in extremely abrasive territories.

The results of tests made up to this time indicate that tungsten carbide is the most suitable material for this purpose. Even with this extremely hard material, present indications are that it must be applied in fairly large quantity in order to result in an appreciable increase in tool-joint life. Inasmuch as tungsten carbide at this time is a rather costly material, and as present methods of application are slow and expensive, there is some doubt as to the over-all economy of this procedure, but the possibilities by no means have been exhausted. Tungsten is now a critical or strategic material, however, and soon may be unavailable for this use.

Some interest now is being shown in the use of hard-surfaced wear subs which seems to offer some promise of success, and field tests also are under way on wear subs having the outer surface flame-hardened. Unfortunately, however, no conclusive results are as yet available on these tests.

Conclusions

Inasmuch as the average contractor or operator is interested much more in the prevention of trouble than in its causes, the authors have summarized herewith the best-known practices, gleaned from all available sourses, observed wherever wells are drilled by the rotary method. The preventive measures are listed more or less in the order of their importance; but, of course, what is quite important in one area may be of much less importance in another.

A. *To minimize drill-pipe troubles.*—1. Use sufficient weight in the drill-collar assembly to more than equal the weight carried on the bit, so that the drill pipe is always in tension. This practice is of highest importance in corrosive areas, to delay corrosion-fatigue failures. Also, it positively will prevent pure fatigue failures and will lessen notch-fatigue failures (from surface scars) in the noncorrosive rock-bit areas. It is of least importance in soft, fishtail areas, probably because the corrosion factor is at a minimum in such areas.

2. Keep the drill pipe straight, especially the lengths immediately above the drill collars. This, again, is of greatest importance in corrosive areas, but is highly important in any sort of drilling.

Keep a straightener on the rig, if necessary; and take care that drill collars, grief stems, and other such elements are straight. Optical instruments for checking the straightness of drill collars and grief stems are gaining favor, particularly in California.

Set the pipe as low as possible in the slips, to prevent crooking when making up or breaking out, and especially when using the automatic cathead. The smaller the pipe, the more easily it can be crooked by tonging, of course.

Run into the hole carefully, unless very free of obstructions, to avoid sudden hanging up of a bit, with possible crooking of the pipe.

Handle drill pipe with reasonable care while trucking, to avoid crooking, especially range 3 pipe; also while catlining into the derrick and when laying down for racking.

3. A very good practice, to insure against fatigue failures, is to move the bottom stand or bottom length of drill pipe just above the drill collar to the upper part of the string, and to keep doing this each time out of the hole. Then, if there is not quite enough weight in the drill-collar assembly, no one length of pipe will be run too long under bending fatigue conditions.

For many years it was thought that high-speed rotation was a very important factor in causing fatigue failures, especially in rock-bit drilling. Today it is recognized that speed is not limited nearly so much by the drill-pipe life as by the effect on other equipment, or by the over-all cost figures.

In Turner Valley, where the drilling is considered to be very hard because of the number of rock bits used, 150 r.p.m. to 250 r.p.m. is the average rotating speed, and it may run above 400 r.p.m. In California one large operator considers 300 to 350 r.p.m. to be an economical speed, and speeds higher than 500 r.p.m., and even 600 r.p.m., have been tried. In neither of these areas are there any alarming drill-pipe troubles.

However, as previously stated, it is suspected that there are some critical speeds which will give undue whipping, and resultant fatigue; but there seems to be no way of calculating what they are.

4. Avoid transverse scars on the pipe, as they are an exceedingly frequent cause of notch-fatigue failure. In some areas, particularly in hard rock-bit drilling, this is the most common of all drill-pipe failures, even in rather new pipe.

Use finely serrated spider slips, never the old-type which make sharp-bottomed circumferential grooves on the pipe.

Use Backup Tongs

Never allow drill pipe to turn in the table slips, but use backup tongs when there is insufficient drill pipe hanging in the hole. If the pipe is rotated, momentarily, with the table slips, be sure that it cannot turn and be scarred by the slips, even though they are of the best modern design.

Drill pipe should not be steel-stencil-stamped, except with especially designed stencils, and never marked with an electric arc.

Not much can be done to prevent scarring from rock-bit teeth and many other causes but, at least, such lengths can be discarded or degraded to less important drilling. Some scars can be filed off, which should be done with longitudinal file strokes.

5. Corrosion fatigue can be eliminated by chemical treatment of the mud, but ordinarily this is considered too expensive. Pending further study of the treatment of the drill pipe itself, at the mill, only a few helpful recommendations for care in the field can be made.

The most important, already mentioned, is to run enough drill-collar weight so that the drill pipe always will be in tension. This at least will remove the bending-fatigue part of the trouble, but it still leaves the corrosion part.

A possible help in decreasing the corrosion phase of the trouble would be to drill with heavier mud. Colloidal mud minimizes corrosion, but there has been only little field study of this suggestion.

A more definite help in minimizing corrosion is to keep the drill pipe free from the corroding formation salts while out of the hole. At least it is quite simple to flush out the inside of the pipe while racking the pipe between wells.

Another suggestion, but not a preventive of corrosion fatigue, is to inspect the pipe at fairly frequent intervals. This particularly means internal inspection to search for corrosion pits which are proceeding into transverse cracks, and it means also the discarding of lengths showing even the smallest of such cracks.

A service is available today which cleans the inside of the pipe with a wire brush, after which the inside surface can be viewed by a very ingenious optical method. By this method it is possible to distinguish positively between ordinary shallow corrosion pits and those which are becoming transverse cracks.

6. Suggestions for preventing trouble from worn pipe, collapsed pipe, pipe which has been fished out, etc., are almost too obvious to need mention in this summary. Here, again intelligent inspection between wells often can avert failures and costly fishing jobs.

Examination of Pipe

The inspection well might be done whenever the string is laid down for tool-joint repairs or replacement. The pipe should be examined especially for crookedness, eccentric wear, slip marks, and all other sharp-bottomed surface scars.

7. When conventional A.P.I. tool joints are screwed onto A.P.I. drill pipe, the work should be done in a properly equipped shop. The threads should be cleaned carefully, lubricated adequately with a good quality of thread lubricant, and the joints should be made up at the proper number of revolutions per minute. Some torque-measuring device should be used to insure that the joints are screwed on with proper tightness to prevent leakage. Then, especially for rock-bit drilling, the tool joints should be welded to the pipe to insure against last-engaged thread failures. The welding should be done before the pipe is ever put in service. After thread failures have started to occur the welding will not always prevent cracks which have barely started from going on to complete failure in spite of the later reinforcement of the weld metal.

8. The mud pressure gage should be watched very carefully, during drilling. Any slight drop in pressure may indicate that a failure is just getting started; thus the pipe often can be pulled out of the hole before the crack proceeds to a complete break.

Instruments currently are being developed which automatically can give warning of very small cracks in the pipe or leaks in the tool joints. One method is tied up with a continuous mud-analyzing service which successfully has predicted a number of pipe failures early enough to get out of the hole (J. T. Hayward).[3]

9. Stuck pipe never should be pulled beyond its yield point, except as a last desperate measure. The yield-strength figures for the various sizes, weights, and grades are furnished by the manufacturers; but before these figures are even approached, all known methods of freeing stuck strings should be tried. Some references to papers on this subject are given in the bibliography of this paper.

B. *To minimize tool-joint troubles.*—1. Tong the tool joints tightly when going into the hole. A good practice is to use one wrap of the jerk line on the cathead for each inch of nominal pipe size: thus three wraps for 3½-in. pipe, four wraps for 4½-in. pipe, etc. This is one of the most important factors in the prevention of wabble failures.

When breaking out, check the joints for tightness by observing the force required. If they break apart easily, they should be bucked up tighter the next time they are made up.

2. Avoid damage to pin and box shoulders while the pipe is being hauled; also avoid damage from striking the box shoulders with the end of the pins when stabbing or when jumping the pins out of the boxes with the spring hook. The condition of the tool-joint shoulders is very critical, especially in the prevention of wabble failures and leaky joints.

Watch for "dry" or "muddy" pins, and with a ring gage check pin and box shoulders carefully for flatness. Whenever possible, remove high spots with files or with shoulder dressing tools. Joints which cannot be repaired in this manner should be reworked in a well-equipped machine shop.

Never switch a damaged pin into an undamaged box or vice versa, as this is most likely to result in increased rather than decreased trouble.

3. Use substantial thread protectors on tool joints when moving pipe, in order to avoid accidental damage to the threads and thus reduce galled or "frozen" pin and box connections.

4. When "breaking in" a new string of joints, it is good practice to tong them up by hand for the first few round trips and then cathead them up tight. High-speed makeup with the spinning line on new joints is likely to result in galled or "frozen" connections.

5. Use a good-quality thread lubricant on tool-joint pin and box connections for normal drilling operations. Apply liberally to threads and shoulders, distributing the lubricant thoroughly with the brush. Do not depend upon rotation of the pin in the box during makeup to distribute the lubricant in the connection. The use of a good-quality lubricant on tool-joint pin and box connections is particularly important when breaking in a new string.

When exceptionally high torque is to be applied to the drill stem, a special lubricant should be used on the tool joints in order to develop a high coefficient of friction in the threads and shoulders, and thus prevent swelled or split-box failures. A lubricant consisting of 1 lb. to 2 lb. of red lead per gallon of kerosene has been found satisfactory for this service.

6. Pay particular attention to the condition of the kelly-sub threads and shoulder. The continued use of a damaged kelly sub seriously may injure every box in the string.

7. Avoid forced makeup of improperly engaged threads. This often results in galled or "frozen" tool-joint connections.

8. Wear on the outer surface of tool joints entails much expense to the operators because, in many territories, it necessitates making several tool-joint replacements on the drill pipe. Not much is known that can be done to prevent this, but during recent years considerable has been done in the development of means of reducing this cost as outlined hereinafter.

Rebuilding Outer Surface

Rebuilding the outer surface of worn tool joints reduces the number of replacements required. Although the cost of rebuilding the outer surface is less than that of new joints, the service obtained from rebuilt joints in most cases has not equaled that of new joints. Therefore, the economics of this practice can be determined only by a careful cost analysis.

Increased life of tool joints can be obtained by the use of oversize joints. The increase in life to be gained by this method is limited by the maximum tool-joint diameter which can be used safely; thus in some of the more abrasive territories this will not be sufficient to eliminate the necessity of making tool-joint replacements.

The use of shrunken-on tool joints has reduced the cost of replacing worn joints, and thereby has aided in reducing the over-all expense resulting from tool-joint wear.

The rate of wear on tool joints actually can be reduced by the use of hard surfacing. Tungsten carbide seems to be the most suitable material for this purpose, but due to the fact that the ma-

terial itself and its application to the joint are both expensive, there is at this time some doubt as to the over-all economy of this procedure.

A promising development in combating the tool-joint-wear problem is the use of wear subs between the joints. The principal advantage is that they can be replaced so readily at the rig, but here again only an accurate cost analysis can determine the over-all economy of this procedure.

New developments in rubber protectors for use in open hole now are being exploited as a means of preventing excessive wear on tool joints. In the past a big objection to rubber protectors has been the difficulty of keeping them in the proper place on the pipe, and also of preventing them from becoming badly cut and torn when they are run in open hole. If the new developments can overcome these difficulties, it is believed that such protectors may be very beneficial in reducing wear on tool joints.

Eccentric wear on tool joints is usually due to the operation of crooked pipe, and the remedy. therefore, is obvious. Although instances are known in which eccentric wear has occurred in the pipe and tool joints even though the pipe remained commercially straight, there is no known remedy for this type of wear.

A point often forgotten is that a drilling string sometimes may be subjected to abuse just in one well, or by just one crew, and later used normally, but in which troubles may continue to develop throughout the rest of its life. A simple example would be where one crew, being very careless in stabbing, damaged a number of the tool-joint box shoulders. This could lead to a succession of wabble failures and mud cutting throughout the whole string.

Or, suppose that on just one well old-type table spider slips were used which scarred the pipe with deep transverse slip marks. These marks easily could be the cause of numerous notch-fatigue failures, no matter how carefully the pipe was used thereafter.

The point is that eternal care with a drilling string, as in the case of all material, is the price of trouble-free service. And, actually, as most operators and contractors are learning rapidly, it is really not a high price at all.

Acknowledgment

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Porosity, Permeability and Saturation of Core Samples

(Continued from Page 41)

and fitted with a reflux condenser which returns the condensate to a calibrated glass trap from which it overflows back to the kettle. The liquid hydrocarbon is boiled and the water present in the sample vaporized, carried into the reflux condenser and caught in the trap. When the volume of water in the trap remains constant after continuel boiling, the volume of water collected is read and the thimble containing the sample transferred to a Soxhlet apparatus, extracted, dried, and weighed. The saturation is usually reported as the per cent of the pore volume in the sample occupied by the fluid in question (oil or water).

If desired, the extraction thimble may be supported above the boiling liquid in the water by distillation apparatus and the extraction carried ou in this apparatus rather than transferring to a Soxhlet.

If sufficiently large samples are available (i.e., samples which contain 5 to 10 cc. of water) the method is accurate to about 2 per cent, which is usually considered to be quite satisfactory in view of the uncertainties unavoidably introduced in coring the formations. With smaller samples the accuracy obtained is correspondingly lower. The method is well suited to handling a large number of samples per day if a sufficiently large bank of the distillation sets is available. An individual distillation usually requires about 2 hours of refluxing, and an additional 6 to 24 hours may be required for the extraction step.

2. Critical solution temperature method.[10]

The water present in the sample is extracted with alcohol (ethyl or isopropyl alcohol) and the temperature at which a mixture of equal volumes of alcohol solution and kerosene becomes clear on heating or turbid during cooling is measured. Because this temperature is somewhat affected by presence of salts in the water and oil during the extraction step, it is necessary to calibrate the method for the particular field brine and crude oil present. The extraction step is most conveniently carried out by crushing the sample under alcohol, and decanting a portion of the alcohol solution for analysis. If about 50 cc. of 98 per cent ethyl alcohol or of 96 per cent isopropyl alcohol are used for each 1 or 2 cc. of water in the sample tested, the critical solution temperature falls in a convenient range (between 25° and 60° C.). When these quantities are used, the critical solution temperature obtained varies about 20° C. per cc. of water present. The method is capable of high accuracy even when only a small sample is available and when combined with the porosity procedure described under Section B, above, a complete saturation and porosity determination can be made for a given sample within 1 hour. The method is not, however, as well suited for handling a large number of samples per day as the water-by-distillation method.

The oil content is determined by weighing the sample before extraction with alcohol, and weighing the rock grains after washing and drying. The difference between these weights less the weight of water found gives the weight of oil present.

3. Titration method.

The water content is obtained by either extracting the sample with anhydrous alcohol (methyl, ethyl or isopropyl) and titrating the alcohol solution obtained to determine its water content, or by distilling the water from the sample (in vacuo at about 80° C.), condensing the water vapor at —80° C. (in a trap cooled with solid CO_2) and titrating the contents of the trap. The titration is carried out with Fischer's reagent[4,8] (sulfur dioxide, iodine, and pyridine dissolved in anhydrous methyl alcohol). As long as water is present in the titration vessel the iodine is reduced by SO_2; when all the water has been used the brown color of the iodine shows that the end point has been reached. The reagent should be protected from light and water vapor and must be standardized frequently against known amounts of water.

The oil content is determined as above, i.e., by weighing before extraction and after extraction and drying and subtracting the weight of the water found.

The method is capable of high accuracy and can be applied when only a small sample is available. Individual samples can be analyzed within an hour if the specimen is crushed to facilitate extraction and drying. The method is not practical if a large number of samples must be analyzed daily.

The procedures discussed above are nearly all combinations or modifications of previously described methods[1] which have been found satisfactory and sufficient to handle various types of core samples and differing requirements of rapidity and accuracy. Other methods which have been tested and found to be less desirable are the retort method[11] or certain special procedures such as the vaporization of water and absorption with P_2O_5, or the extraction of oil with pentane followed by recovery of the oil by distillation, as methods of saturation analysis, or the measurement of porosity by a Toepler pump type of apparatus.[3]

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Refiners See Greatly Expanding Need of Asphalt at Airports

Through the Western Petroleum Refiners Association refiners are being warned of the need to supply asphalt for runways at a larger number of airports to be built if the United States is to accommodate adequately the large fleets of military planes under construction and planned. A digest of the conclusions of the association committee dealing with the subject includes:

It is unwise to place entire reliance upon a few large airports.

Airport paving surface must be of a character readily repaired, and immediately usable after repairs have been made.

The number of planes that can be operated from one field is much smaller than popularly supposed—for example: La Guardia Field, in New York City, one of the country's largest, can handle only about 200 planes a day. From a purely defense standpoint New York City should have a dozen airports. So should every other metropolis.

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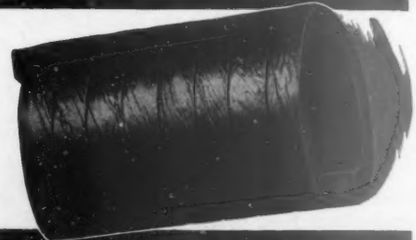

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Pipe-Line Activity

Sinclair Prepares to Construct Pennsylvania Products Line

According to reports from Pennsylvania, Sinclair Refining Co. has started construction on the first section of the 340-mile 6-in. line for the transportation of refined products from Marcus Hook, Pa., to the Pittsburgh, Pa., district. Operations are starting in the vicinity of Lancaster and Harrisburg, Pa., as well as at other points. The immediate program calls for the laying of a section consisting of more than 170 miles which has been contracted by Sheehan Pipe Line Construction Co. and O. C. Whitaker Co.

Early in the year Sinclair interests applied for a charter in Pennsylvania for Union Pipe Line Co. preparatory to obtaining authorization for the project. During the spring, pipe was delivered at points along the right-of-way in the period when surveys were being made.

Phillips Will Loop 72 Miles Of Products Line in Missouri

Phillips Petroleum Co., according to reports, is preparing to lay 72 miles of 8-in. pipe in seven loops to the section of the company's trunk line in Missouri which is part of the system for transporting refined products from Borger, Tex., to Chicago, Ill. The laying of the line will begin in December.

Cities Service Starts Cement-Oklahoma City Line

Cities Service Gas Co. began construction of 52.7 miles of 16-in. gas pipe line from Cement to Oklahoma City, Okla., at the end of last week. This is the first line built by the company by contract for 10 years. It has been the company's practice to lay all line with the company's own organization. Contract for the work has been awarded to Midwestern Engineering & Construction Co. The line is to be electric-welded.

Stanolind Expands Lines Serving Kansas Fields

Stanolind Pipe Line Co. is embarking on an expansion program which involves the construction of a total of 95 miles of various sizes for extending as well as looping the company's system in Kansas.

The 8-in. line of the company which now goes as far west as the Richardson pool, Stafford County, Kansas, will be extended 16 miles farther west. A 16-mile 6-in. line will be laid to the Pawnee Rock pool; a 9-mile 4-in. line will connect the Albert-Otis area with the company's system.

Contracts have been let for the 32 miles of 6-in. and 8-in. in this program to J. C. Truman Construction Co. The 9 miles of 4-in. will be laid by Osage Construction Co.

The main trunk line between Washington, Kans., and Freeman, Mo., will be further expanded. The company has recently completed 62 miles of 10-in. pipe which has been laid for looping this line so as to increase capacity from 30,000 to 45,000 bbl. Arrangements have just been made to increase the capacity of this section of the trunk line to 55,000 bbl. by the construction of 12-in. loops. Contracts for this work have been let as follows: O. E. Dempsey Construction Co. has a contract for 29 miles of this project between Washington and Elmont station, near Topeka, Kans.; C. S. Foreman Co. has 25 miles extending northwest from Freeman, Mo.

Near La Harpe, Kans., 4 miles of 12-in. is being removed from the company's system which will be repaired and used for the looping program. Most of the 12-in. pipe to be laid between Washington and Freeman will be new pipe. Extensions in western Kansas, including those to the Pawnee Rock and Albert-Otis area, will be built with approximately equal amounts of new and used pipe. Work on the extensions in western Kansas is now going on and will be completed by the first of the year. Laying of the Washington-Freeman loops starts about December 1 and will be completed toward the end of January.

J. Marston Linehan Becomes General Superintendent of Mid-Continent Pipe Line Co.

J. Marston Linehan, formerly assistant to J. A. Beyhan, deceased, has been appointed general superintendent, Mid-Continent Pipe Line Co. Mr. Linehan joined the Mid-Continent pipe-line staff November 1933 and served as superintendent of the system's southern division until last year when he became assistant to Mr. Beyhan on the retirement of S. I. Ford, formerly northern division superintendent. J. A. Beyhan died in Oklahoma City, October 14. Mr. Linehan is the son of J. J. Linehan, pipe-line department of Sinclair Refining Co.

Shipments Are Made Through Portland-Montreal Line

Crude-oil shipments have been moving through the Portland-Montreal pipe line since November 10. The project was rushed to completion in the record time of 142 days. The nation's first national-defense pipe line, the 236-mile pipe line between Portland, Me., and Montreal, Canada, was formally opened by Gov. Sumner Sewall of Maine and A. Clarke Bedford, president of Colonial Beacon Oil Co., who opened a valve at the new pumping station at South Portland, Me., to send the first crude oil flowing through the nation's newest pipe line. The initial shipment of crude, already in storage at South Portland, was discharged this week from the tanker Esso Dover, which docked with a 103,000-bbl. cargo from Covenas, Colombia, South America.

The new pipe line, costing $8,500,000, will save hard-pressed tankers en route to Montreal refineries 12 days on a round trip between South American or Gulf ports and Canada by permitting them to discharge their cargoes at South Portland. This will eliminate the long trip through the Gulf of St. Lawrence and down the St. Lawrence River to Montreal.

Ground was broken for this new pipe line on June 21, 1941. Since that time 32,700 tons of 12¾-in. pipe have been laid and welded; there will be eight pumping stations. At the outset only four of these pumping stations will be operated, due to difficulties encountered in obtaining necessary materials and pumping equipment.

The four additional stations are expected to be in operation shortly after the first of the year. Officials of the line said that with four stations pumping the new Esso pipe line will handle about 25,000 bbl. of oil daily, as against a 60,000-bbl. maximum daily capacity when all stations are in operation.

The section of the line in the United States is

Pipe-Line Personalities . . . . R. V. Hanrahan

R. V. HANRAHAN, president, Humble Pipe Line Co., Houston, Tex., completed 40 years of continuous service in pipe-line work on July 1, 1941. His first job was with Indiana Pipe Line Co., for which he started working in the pipe-line gang in 1901. For the next 3 years he worked for this company as timekeeper and in other capacities. Later he held positions as general foreman and assistant construction superintendent for Ohio Oil Co. During the 5 years he was with this company he was connected with the supervision of pipe lines constructed to eastern states as well as other points.

When Standard Oil Co. of Louisiana laid the first crude-oil pipe line to the Baton Rouge, La., refinery, he was general foreman for this construction project. Following the completion of this line he became a district foreman and remained with the company 10 years.

On March 6, 1919, he joined the organization of Humble Pipe Line Co. as superintendent in charge of the laying of the company's first line from the West Columbia field to the trunk-line station at Webster, Tex., between Houston and Galveston, Tex. He was also placed in charge of laying the company's main line from Comyn, Tex., to the Gulf Coast, as well as other lines laid in the period following World War I. In 1920 he was elected to the board of directors of Humble Pipe Line Co. The next year he became vice president and general manager. He was elected president of the company in 1925.

owned and operated under the name of Portland Pipe Line Co. The Canadian section is under the name of Montreal Pipe Line Co., Ltd. Both companies are owned by Standard Oil Co. of New Jersey.

Great Lakes Stockholders Consider Public Offering

Steps have been taken by stockholders of the eight oil companies that control the Great Lakes Pipe Line Co., a gasoline carrier from Ponca City, Okmulgee, West Tulsa and El Dorado to St. Louis and Chicago, to dispose of their stock in the firm to an underwriting group which would offer the securities to the public.

The conversations have been strictly preliminary and the so-called negotiation stage has not yet been reached.

Approval for such a step would hinge upon action of the Interstate Commerce Commission and many other details would have to be ironed out before active negotiations could be undertaken, it is declared.

Continental Oil Co., Cities Service Oil Co., Phillips Petroleum Co., Mid-Continent Petroleum Corp., Skelly Oil Co., Sinclair Refining Co., Texas Co., and Pure Oil Co. are the eight firms controlling Great Lakes Pipe Line Co.

Pennsylvania Gas Co. Provides for Higher Pressure

An 8-in. pipe line now under construction will link the Wetmore gas field, Pennsylvania, to the Roystone station of the Pennsylvania Gas Co., through the Ludlow district. The conduit will be about 8 miles long.

The line, according to reports, will be parallel with another 8-in. line which carries gas from the Wetmore field to Roystone. Purpose of the construction is to maintain pressure.

Panhandle Eastern Plans Refinancing

The directors of the Panhandle Eastern Pipe Line Co. have approved a new financing program amounting to $25,000,000 for acquiring certain properties, redeeming the outstanding 6 per cent preferred stock and defraying the cost of construction already authorized.

The new financing will consist of $10,000,000 first mortgage 3 per cent bonds and $15,000,000 new preferred stock. The proposed issues would be offered at competitive bidding if approved by the SEC.

Panhandle Eastern proposes to purchase the Michigan Gas Transmission Corp. and Indiana Gas Distribution Corp. from Columbia Gas & Electric Corp. and certain gas pipe lines in Indiana and Ohio from Ohio Fuel Gas Co. for an aggregate consideration of not more than $11,281,326.

Redemption of the preferred stock would require about $10,000,0000 and the balance of the proceeds, together with funds on hand, would be used to pay for the construction program, which includes the addition of 245 miles of pipe, looping its present main-line system, and the installation of several compressor units.

J. D. Creveling, president, said acquisition of Michigan Gas Transmission Corp. would result in a unified system since these properties were in effect an integral part of the Panhandle Eastern pipe-line system transporting natural gas from Texas to Indiana, Ohio and Michigan.

Chancellor W. W. Harrington has ordered the receivers of the Missouri-Kansas Pipe Line Co. to pay the estate of Henry Ridgely $15,186.85 for his services as solicitor to the receiver. Missouri-Kansas Pipe Line Co. has been active in Panhandle Eastern affairs as a minority stockholder.

In a second order, the chancellor ordered that the receivers pay Dupuy G. Warrick, one of several complainants, interest on the sum of $132,883.14 as compensation and reimbursement for his service from December 23, 1936, to December 28, 1940, the interest rate to be 6 per cent.

Leonard Operates Outlet For Roscommon Field

Leonard Pipe Line Co. has started to pump crude through its new 13-mile 6-in. pipe line that provides the first outlet for the new Roscommon field, Ohio. Oil is being moved south to Sohio Pipe Line Co.'s Hamilton station where it can be pumped to most of the main refining centers of the state.

Drilling Crew Breaks Gas Pipe Line

A 3,000,000-cu. ft. gasser brought in by the drilling crew of a Brookville, Pa., contractor at a depth of only 4 ft. caused much ribbing at his expense. The bit entered an 8-in. gas line of the Phillips Gas Co.

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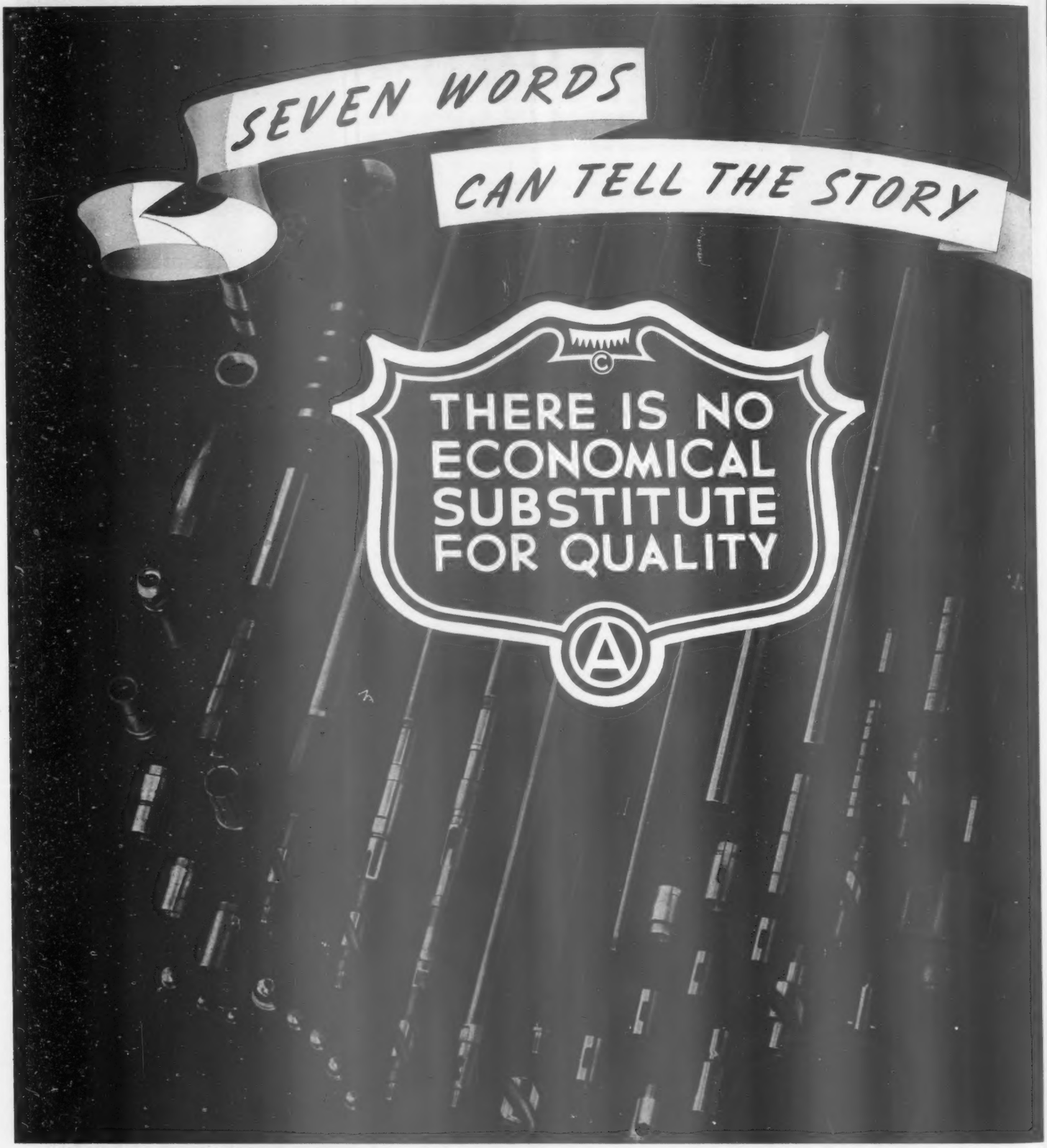

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions reported during the past week numbered 610, an increase of of 5 over the previous week. Oil-well completions were up 7 and gas wells down 2. As wildcats remain at a high level, it is believed that bad weather continues to hold up routine activity in many areas.

Since the question of reserves has been brought into prominence by operators and government officials alike during the past few weeks, a report from Canada that commercial production has been obtained from the tar sands of the Athabaska River for 6 months is of particular interest (p. 90, this issue). Present production is, of course, small as the present operations are being conducted on an experimental basis, but the plant is recovering approximately 110 bbl. per day from 134 tons of bituminous sands. This indicates an oil content in excess of 25 per cent of the volume of the sands.

The tar sands are located in an area some 10,000 sq. miles to the northeast of Edmonton and furnish by far the largest known reserves of oil. The Geological Survey of Canada has estimated their total content at 100,000,000,000 bbl. while the U. S. Geological Survey's estimate is 100 per cent greater making the known reserves in this area 10 times the estimated proven reserves of the United States. It is improbable that these deposits could be developed to an extent where the oil would enter the American market in competition with domestic crude at present prices, but they provide a reserve of enormous importance should the price of oil ever rise to the point where large-scale exploitation is possible.

Operations last week were of a routine character except for what is hailed as a discovery of major importance in the Smackover lime of southern Arkansas. Lubbock County, Texas, has entered the list of producing areas and Dawson County appears to be next in line. The northeasterly extension of the West Texas play promises considerable activity during the next year, particularly since other scattered tests report encouraging shows.

WEST TEXAS: Colby sand production is opened up east of the Emperor field and south of Keystone in which this pay is also found. Winkler County's deep test has been plugged back from the Devonian to test regular Permian pays. Local structural conditions in the Sand Hills extension area are throwing the Ellenburger low but production is also being reported in the Simpson in this sector. The Lubbock County discovery has been completed and gages 165 bbl. in the Clear Fork (p. 76).

NORTH TEXAS: Saturated conglomerate is reported in a wildcat near Crowell, Foard County (p. 79).

SOUTHWEST TEXAS: Frio-Vicksburg sand shows gas-distillate 1½ miles north of the Sun field. A well extending Yturria may also mark the limit of the field as it showed water as well as oil. The Washburn discovery well reports water intrusion. Willamar has been extended to the southeast by the fifth well to be completed in the field (p. 63).

ARKANSAS: Smackover lime production has been found northwest of Schuler and south of Mount Holly. The discovery is considered of major importance (p. 70).

OKLAHOMA: A wildcat northeast of Stroud reports a hole full of oil from the Wilcox. A new Dutcher sand area has been opened in Creek County. The State Capitol district in Oklahoma City continues active and tests now planned to be whipstocked under Lincoln Terrace will have considerable influence on plans for recovering the oil still remaining in the field (p. 71).

KANSAS: Pawnee Rock continues to grow, the latest outpost having stepped out 2 miles east of the pool. It made a good well in the Arbuckle. A Viola lime pool was opened in southeast Reno County. Lansing-Kansas City production in the Raymond pool was extended to the northeast. In Barber County, the Lake City pool has a new pay, the Simpson. Previous production was from the Arbuckle (p. 68).

TEXAS GULF: A deep Wilcox pay has been found in the Fostoria district, Montgomery County. The deepest test on the coast has extended Lake Creek in the upper part of the Wilcox after plugging back from the lower part of the formation. Cockfield production is reported in a test in the Goodrich area, Polk County (p. 77).

EASTERN TEXAS: The Pleasant Grove district, Rusk County, is in the spotlight as a test to the southwest reports oil in the Nacatoch and an offset to the discovery well blew out from the Woodbine. The Athens pool opener has been gaged as a 355-bbl. well in the Rodessa series after 3 months of testing (p. 86).

WYOMING: A projected Tensleep test on Sherrard dome in Carbon County reports 6,000,000 cu. ft. of gas in the Lakota. It previously had 1,000,000 cu. ft. in the Frontier (p. 78).

LOUISIANA GULF: A new deep sand has been found in an outpost of the old Vinton field. Bayou Sale increases in importance as a new sand is picked up. Erath has been extended to the west (p. 82).

CALIFORNIA: A new zone, which had been passed up by early wells, has been opened in the North Belridge field by a 2,000-bbl. well. A west outpost to Raisin City has been abandoned after penetrating the Eocene and testing the upper 128 ft. of the Cretaceous. The latest southern California earthquake opened up the seams of two tanks but appears to have left the oil wells alone (p. 73).

NORTH LOUISIANA: Testing of the Catahoula Lake district continues following showings in Rapides Parish. The promised discovery is not doing so well on tests (p. 70).

PENNSYLVANIA: The largest Bayard sand gasser in several years was completed in Allegheny County. It made 9,000,000 cu. ft. (p. 87).

ILLINOIS: Jasper County may have a new McClosky pool following tests in a wildcat 6 miles east of the Dundas field. Aux Vases production is in prospect in Coles County, in the northern part of the basin (p. 65).

MISSISSIPPI: Construction of new loading racks at Tinsley permitted an increase in production sufficient to cause Mississippi to replace Arkansas and Pennsylvania, becoming the eighth largest producing state (p. 62).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended November 15, 1941)

	Oil	Gas	Dry	Total	1941 total comp. to date	1940 total comp. to date
N. Y., Pa., and W. Va.	97	18	3	118	5,235	4,912
Ohio	14	12	14	40	1,506	1,344
Indiana	2	1	5	8	451	395
Kentucky	5	4	8	17	597	516
Illinois	33	0	18	51	3,221	3,375
Michigan	16	3	7	26	802	1,024
Kansas	30	3	16	49	1,902	1,634
Nebraska	0	0	0	0	75	39
Missouri, Iowa	0	0	0	0	33	33
Oklahoma	23	6	9	38	1,652	1,671
Texas:						
North Central Texas	29	2	20	51	2,411	2,483
West Texas	36	0	1	37	1,985	1,654
Texas Panhandle	13	3	0	16	596	498
Eastern Texas	10	0	2	12	929	550
Texas Gulf Coast	18	3	2	23	959	1,053
Southwest Texas	23	3	6	32	1,652	1,859
Total Texas	129	11	31	171	8,532	8,097
North Louisiana	7	2	7	16	682	581
Louisiana Gulf Coast	9	1	7	17	751	889
Total Louisiana	16	3	14	33	1,433	1,470
Arkansas	1	1	2	4	176	145
Mississippi and Southeast	6	0	2	8	246	178
Montana	2	1	0	3	258	215
Wyoming	0	0	1	1	156	145
Colorado	0	1	0	1	28	15
New Mexico	6	0	1	7	246	553
California	25	1	9	35	988	903
Total United States	405	65	140	610	27,537	26,664
Total previous week	398	67	140	605		
Week ended Nov. 16, 1940	380	56	145	581		

Increased Capacity of Outlets Raises Tinsley Production

By R. MARNE SANFORD

JACKSON, Miss., Nov. 18.—Completion of several new loading racks, together with talk and plans for at least two direct pipe-line outlets, brightens the oil-transportation outlook for the Tinsley field of Mississippi. The field now embraces about 12,000 proven acres and has 291 producing wells, but to date has lacked a pipe-line outlet. Creation of new markets has caused producers and transporting companies alike to view more favorable conditions for the coming months.

The Tinsley field had a daily average production of 75,806 bbl. for the week ended November 11. This represents an increase of about 10,000 bbl. daily over the previous high-production peak and of course, set a new high for total daily oil produced in the state, bringing that figure to 76,294 bbl. daily. New loading racks in the field are directly responsible for this increase and will continue to influence production. More new racks are now under construction.

Table 2 shows the tank-car shipments from the field for the week ended November 11. A majority of the oil goes to the East and Middle East, much having Illinois as its destination.

Union Producing Co. Has 100-Car Rack

Union Producing Co., largest producer in the Tinsley field, in 1939 constructed a 12-car loading rack. This represented the company's shipping facilities for the field at that stage of development. In August of this year, with production still rising, the rack was enlarged to embrace 100 cars. The project called for installation of about 507 ft. of rack and loading line with accommodations for 52 more cars, 26 on each side. The rack had previously been enlarged to embrace 48, or 24 cars on each side. It now is 966 ft. long and will load 50 cars at a time. The spill pipes are swung loose so that they may be directed to either side of the rack to load 50 more cars without side-tracking.

Because of the rough topography of the Tinsley field, it is practical for the oil to flow by gravity from the storage tanks into the 8-in. header line running beneath the loading rack at two different points. This arrangement tends to equalize the pressure and delivery of oil into the tank cars. The oil flows from the storage tanks which are at a higher elevation, down the header line on the loading rack and up through fifty 3-in. risers, past the double swing joints and into the spill pipes that empty into the cars. Each riser is equipped with a 3-in. gate valve to control the flow.

Under normal conditions two loaders handle 24 cars at a time, 12 on each side of the rack, and load 5 cars an hour. Basic sediment is removed from the bottom of the cars and drained to a dump pit. Cars are filled, checked, and inspected, at the rate of about 12 minutes per car. Most of the cars used are 10,000 gal. capacity, however, the risers on the rack are of sufficient height to handle the 12,000-gal. type. A record recently was made at this rack when 20,000 bbl. of oil was loaded in one 24-hour period.

To increase the field storage of Union Producing Co., the firm has recently completed a new 74,000-bbl. storage tank and a 55,000-bbl. tank. This brings the company's total field-storage capacity to 284,000 bbl., being divided among one 80,000-bbl. tank, one 74,000-bbl. tank, two 55,000-bbl. tanks, and two 10,000-bbl. tanks.

Three New Loading Racks At Anding in Field

Late in September of this year the Sinclair-Wyoming Oil Co. completed a new 10-car loading rack at Anding, Miss., in the Tinsley field. Shipments of oil were started September 25 to the Sinclair refinery at Marcus Hook, Pa. During the week ended November 11, the company shipped 65 cars from its rack to Marcus Hook. The new rack accommodates five cars on each side, but is expected to be enlarged as production increases for the Sinclair-Wyoming operating firm.

Also at Anding, Miss., the Sohio Oil Corp. has finished building its 6-in. line from the field to its loading rack. Last week the company completed a 5,000-bbl. crude storage tank on the Midstates Oil Co.'s Cummings lease in the S½ 31-10n-2w, and transportation of oil from the field to the rack thence to its eastern markets will start at once.

Hassie Hunt, second largest producer in the Tinsley field, has completed a new 6-in. line from his Stutts lease in 30-10n-2w, to his loading rack at Anding, Miss. This will increase the daily shipments of oil from this rack and will probably lead to enlargement of the rack as development on the lease continues.

TABLE 1—PURCHASERS AND POSITION OF PRODUCING FIRMS

(Week ended November 11)

Transporting firm, producer—	No. Wells	Bbl. prod.
Hassie Hunt:		
Amerada Pet. Corp.	5	1,040
W. L. Ethridge	2	393
Hassie Hunt	35	12,075
Hassie Hunt and Carl Jones	1	350
Magnolia Pet. Co.	14	4,011
H. Hunt and Sohio Pipe Line:		
Midstates Oil	10	3,625
Allied Pipe Line Corp.:		
Bridewell & Beckett	4	620
J. P. Evans	7	1,658
Frankel Bros.	1	135
Gholson-Hodge-Culberson	4	620
W. B. Johnson Drlg. Co.	6	930
Johnson Drlg. and Texas Co.	2	310
E. C. Johnston	1	155
M. Carl Jones	3	310
Key & Beckett	1	155
S. H. Killingsworth	1	135
A. R. Mathews	1	155
Plains Production Co.	2	310
W. G. Ray Drlg. Co.	2	310
Sample & Falvey	1	155
Snowden & McSweeney	4	465
Sohio Pipe Line Co.:		
W. C. Feazel	1	329
Kirby Pet. Co.	5	1,693
Love Pet. Co.	6	1,114
C. H. Lyons	4	1,222
Phillips Petroleum Co.	3	347
Roeser & Pendleton, Inc.	4	504
G. L. Reasor	4	1,077
Sylvan Pet.	6	1,872
E. C. Johnston:		
E. C. Johnston	10	2,290
Jones-O'Brien:		
Jones-O'Brien	7	972
Sinclair:		
Sinclair-Wyoming Oil	8	2,049
Slick-Urschel:		
Slick-Urschel	16	2,813
United Oil Pipe Line Co.:		
Union Producing Co.	111	31,687
Total	291	75,806

TABLE 2—TANK-CAR SHIPMENTS

(Week ended November 11)

Shipping firm and destination—	No.
Allied Pipe Line Corp., Centralia, Ill.	14
Allied Pipe Line Corp., East Chicago, Ind.	63
Allied Pipe Line Corp., Milan, Ill.	35
Allied Pipe Line Corp., St. Elmo, Ill.	41
Total, Allied Pipe Line Corp.	153
Hassie Hunt, Baton Rouge, La.	76
Hassie Hunt, Catlettsburg, Ky.	4
Hassie Hunt, Covington, Ky.	7
Hassie Hunt, Maryland, La.	458
Total, Hassie Hunt	546
E. C. Johnston, Vicksburg, Miss.	98
Jones-O'Brien, Inc., Maryland, La.	28
Sinclair-Wyoming Oil, Marcus Hook, Pa.	65
Slick-Urschel Oil, Maryland, La.	69
Slick-Urschel Oil, Memphis, Tenn.	12
Total	81
Sohio Corp., Baton Rouge, La.	60
Sohio Corp., Catlettsburg, Ky.	8
Sohio Corp., Centralia, Ill.	4
Sohio Corp., Covington, Ky.	106
Sohio Corp., Louisville, Ky.	14
Sohio Corp., Memphis, Tenn.	78
Total, Sohio Corp.	270
United Oil Pipe Line Co., Covington, Ky.	134
United Oil Pipe Line Co., Lemont, Ill.	119
United Oil Pipe Line Co., Maryland, La.	244
United Oil Pipe Line Co., Sellers, La.	91
Total, United Oil Pipe Line Co.	650
Grand total	1,891

Direct Pipe-Line Outlet Appears Near

There are at least three rumored pipe-line projects for the Tinsley field. How many will develop is not known. Several weeks ago the Sohio Oil Corp. announced formally that work had begun toward securing right-of-way for its proposed line from the field to Memphis, Tenn. This project had been contemplated for several months. At the Memphis end of the line, oil will be barged to Latonia, Ky. The latest report concerning this project is that all of the right-of-way will be obtained this year but that the actual laying of the line will not start until 1942. The size of the pipe line to be laid or the capacity has not been released.

Two other pipe-line outlets for the area were reported last week to be under consideration. The Mississippi Pipe Line Co. has been chartered for the operation of a Tinsley field crude-oil carrying system from that field to Vicksburg, Miss. Right-of-way has been acquired along state Highway 3 from Sartartia to Vicksburg. It is reported that the company has a priority rating to permit immediate construction of the carrier. It will be a 6-in. line and could transport 30,000 bbl. daily of crude to markets in the Middle West. Officers of the company are George E. Lilly, New Orleans, La., president; John Pundt, Dallas, Tex., vice president; Tally Ridell, Jackson, Miss., secretary, and H. S. Braimin, Houston, Tex., treasurer.

A direct pipe line carrier is needed to furnish rapid and economic outlet facilities for this growing field. Table 2 shows that 1,891 tank cars are sent from the field weekly. Pipe-line outlets for the field would release some of the tank cars for other service.

The Tinsley field has not been under a form of "outlet proration." However, the lack of sufficient oil-transportation facilities has slowed development to some extent. This should be corrected with pipe-line outlets.

New Pipe Line Stimulates Logansport Gas Field Activity

Probably steady development will be seen for the Logansport gas field of De Soto Parish. Offering incentive for further drilling in the field, Southern Natural Gas Co. has recently placed in operation a new 120-mile pipe-line outlet for the field's wells. The line runs from the field to the town of Monroe to the northeast and in Ouachita Parish where it ties into the company's main line from the Monroe gas field there.

This Logansport field has been in the past developed on a 320-acre spacing pattern. Considerably wider than the spacing in other gas fields, the Louisiana State Conservation Commission has indicated that all future development must continue to conform to this pattern.

The Southern Natural Gas Co. has several wells in the field which are feeding its new pipe line and also have considerable undeveloped acreage which is considered to be proven for gas production. Should a smaller spacing pattern be adopted for the field it is thought that increased drilling will be seen.

Superior Oil Co. of Tulsa is seeking special permission to test its 1 Slaid, 3-11-15, De Soto Parish, on the southeast flank of the field. The test found salt water in the Pettit lime from 6,065-6,145 ft. and 6,018-42 ft. and will attempt to find gas production in the Glen Rose level, the regular horizon for the field.

The Slaid well was drilled on a tract totaling only about 200 acres and since the spacing rule applies to the gas level of the Glen Rose zone the company did not need special permission to attempt to establish oil production from the Pettit lime. Following the failure of the attempt the company must abandon the well if it fails to receive special permission to produce gas from the Glen Rose from a tract of less than unit size.

Frio-Vicksburg Sand Shows Distillate North of Sun Field

By F. L. SINGLETON

CORPUS CHRISTI, Tex., Nov. 17. — Extensions to proven fields in the Rio Grande Valley district, and the announcement of several interesting wildcats were the highlights of development in the Southwest Texas district the past week.

Sun 1-C Montalvo, 1½ miles north of the Sun field, Starr County, showed promise of production as two drill-stem tests in the Frio-Vicksburg sand tested gas and distillate. A 5-minute drill-stem test at 4,310-16 ft. recovered 2 gal. of distillate and tested 440 lb. working pressure, while a 5-minute test at 4,333-36 ft. recovered 15 ft. of distillate and tested 385 lb. working pressure. At the close of the week the crew was waiting for orders, and the hole is expected to be drilled deeper. This field was one of the first to be found along the south end of the Frio-Vicksburg trend, and at a recent date approximately 65 wells were producing, having a daily initial production of 1,411 bbl.

Yturria Extension Test May Limit Field

In the southern part of the county, and located in the new Yturria field, an extension of approximately 1,100 ft. was indicated by Sun 1-A Chapotal. While the well is drilling ahead in sand below 4,266 ft., drill-stem testing in the discovery pay at 4,248-51 ft. recovered 1,000 ft. of pipe-line oil and tested 99 lb. working pressure. That the well may have established the water level in this sand was indicated as a 15-minute drill-stem test at 4,258-66 ft. recovered 40 ft. of oily mud and 260 ft. of oil and salt water. This is the third well to be drilled on the structure, being located north of the company's 5 Chapotal, recently completed in sand bottomed at 4,236 ft. to open a 4,100-ft. northwest extension.

Willamar Extended to Southeast

Production in the Willamar field, Willacy County was extended several hundred feet southeast with the completion of Pan American 1 Hodge, which is flowing at the daily rate of 135 bbl. of 35.1-gravity oil through a ¼-in. choke. Tubing pressure was 2,040 lb. Hard and soft sand showing oil was cored at 7,861-7,946 ft., and the well was completed with 7-in. casing cemented at 7,846 ft. This is the fifth producer for the structure being located in the south extension area, approximately 1½ miles from the discovery well.

Water Intrusion Reported in Washburn Discovery Well

Salt water is reported to have made its appearance in Quintana Petroleum Co. 1-B Washburn, completed the previous week in the Wilcox sand to open a mile-southwest extension to the Washburn field, La Salle County. The well was placed on a ⅛-in. choke during the week and it flowed at the rate of 138 bbl. of fluid per day, of which 94 per cent was oil and 6 per cent salt water. Production is from perforated casing opposite oil sand at 5,530-50 ft. A gas sand was logged in the upper section from 4,822-52 ft., while sand showing oil was logged from 5,134-51 ft., and from 5,513-89 ft.

Wildcat Activity

Jim Wells County gained a new wildcat operation as Bridwell Oil Co. moved in material for 1 J. P. Blake, Jr., about 1½ miles southwest of the Ben Bolt field in the La Trinidad grant. Contract depth is 5,700 ft. Other new wildcat activity that will be watched with interest was announced for Calhoun and Refugio counties. In Matagorda Bay, about 1 mile east of Port Lavaca, Calhoun County, Amerada Petroleum Corp. staked location for 1 Lavaca State, a projected 10,000-ft. test located in tract No. 10. Three miles west of Refugio, Hewitt & Dougherty are moving in a rig for 1-C Birdie D. Rooke, an 8,200-ft. test located in Block 3, John James Survey.

Shallow Gas-Distillate Sand Found at Odem

Gas-distillate production from a shallow sand was opened in the Odem field, San Patricio County, with the completion of Seaboard 4 Lane, which flowed 2,600,000 cu. ft. of gas and 5 bbl. of distillate on ¼-in. and 9/64-in. chokes from perforated casing at 3,541-46 ft. Dry gas from still another sand was indicated by Wellington Oil Co. 2 Lane, a south offset to the company's 1 Lane. Sand and shaly sand with a gas odor was cored from 3,197-3,217 ft., and a 5-minute drill-stem test at 3,200-17 ft. tested 315 lb. working pressure and 60 ft. of mud. Main production in the field is from sand below 5,500 ft. Approximately 2 miles southwest of the town of Sinton, Tide Water Associated Oil Co. is moving in material for 1 San Antonio Loan & Trust Co., a 7,000-ft. test located in the M. McAuley Survey. Argo Oil Corp. 1 Wright, a wildcat recently started 2 miles northwest of the town of Mathis, is drilling in shale below 3,275 ft.

Activity at Agua Dulce Increases

Drilling activity in the Agua Dulce field, Nueces County, continues to be increased with the announcement of four new locations. Pan American Production Co. is starting an east outpost on the Aetna Life Insurance Co. lease in Section 3060, Bishop subdivision of the Palo Alto grant, while Sam E. Wilson is moving in for 3 Rivers, about 1 mile northeast of the operator's 2 Rivers, recently completed on the northwest side of the field in sand at 5,829-44 ft. On the southeast flank the same operator staked location for 2-B Pfluger, in Section 186. At the present time, 16 operations are reported in the field, and this is expected to be increased as extensions to the producing areas continue to be extended.

SUMMARY OF COMPLETIONS

Lower Gulf Coast District

	No.	Bbl.	Footage
Oil wells: Fields	11	1,139	60,088
Gas wells: Fields	2	.....	9,450
Total	13	.....	69,538

Laredo District

	No.	Bbl.	Footage
Oil wells: Fields	11	1,255	38,309
Gas wells: Fields	1	.....	5,500
Dry holes: Fields	1	.....	2,700
Wildcats	5	.....	16,480
Total	18	.....	62,989

South Central Texas District

	No.	Bbl.	Footage
Oil wells: Fields	1	3	462

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Fields

Ben Bolt, Jim Wells County: Bridwell 2 Elizondo, 310 bbl., ⅛-in. choke, perf. casing 4,820-25½ ft., T.D. 4,827 ft.

Clara Driscoll, Nueces County: Texas Conservative 8 Huie, 25 bbl., 9/64-in. choke, perf. casing 3,822-25 ft., T.D. 5,488 ft.

Texas Conservative 2 Taylor, 142 bbl., ⅛-in. choke, perf. casing 5,248-52 ft., T.D. 5,425 ft.

Cologne, Victoria County: Cox & Hamon 1 Ball, 77 bbl., 7/64-in. choke, perf. casing 4,640-42 ft., T.D. 4,887 ft.

Fagan, Refugio County: P. R. Rutherford 5-C Fagan, 80 bbl., 3/32-in. choke, perf. casing 5,644-47 ft., T.D. 5,650 ft.

Midway, San Patricio County: Midway Victory Oil Co. 6-A Floreke, 108 bbl., ⅛-in. choke, perf. casing 5,323-25 ft., T.D. 6,075 ft.

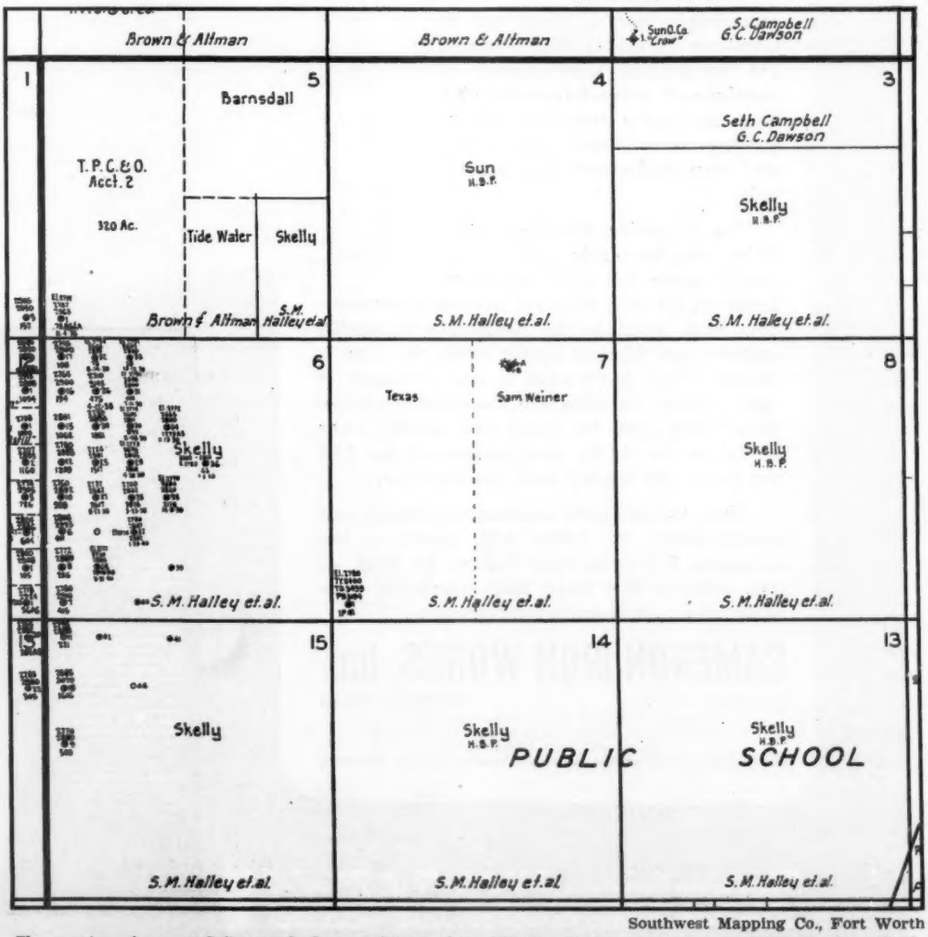
Minnie Bock, Nueces County: Clark & Cowden 1 Robertson, 34 bbl. oil and 25 bbl. salt water, 5/32-in. choke, perf. casing 3,800-05 ft., T.D. 3,825 ft.

North McFaddin, Victoria County: Texas Gulf 1 Rush, 10,000,000 cu. ft. gas, perf. casing 5,169-62 ft., T.D. 5,903 ft.

Odem, San Patricio County: Seaboard 4 Lane, 2,600,000 cu. ft. gas, ¼ and 9/64-in. chokes, perf. casing 3,541-46 ft., T.D. 3,547 ft.

Richard King, Nueces County: Southern Minerals 16

(Continued on Page 70)



Southwest Mapping Co., Fort Worth

The opening of a new Colby sandy lime pool in southern Winkler County was announced this week, with the completion of Ted and Sam Weiner 1-B Halley, Section 7, Block B-11, P.S.L. Survey. No. 1-B Halley rated a daily potential of 370 bbl. of oil. The discovery is 1 mile east of Emperor pool and 7 miles south of Keystone pool

"OUR FLEX-SEAL MUD VALVE MAINTENANCE COST IS EXTREMELY LOW"

Says Joseph S. Morris of Allen and Morris, Drilling Contractors

ALLEN & MORRIS
DRILLING CONTRACTORS
ALAMO NATIONAL BUILDING
SAN ANTONIO, TEXAS

October 20th, 1941

Cameron Iron Works, Inc.
711 Milby Street
Houston, Texas

Gentlemen:

Our equipment records are so arranged that it would be difficult for us to determine the exact maintenance cost on our Flex-Seal mud valves, but we do know that this cost is extremely low compared to the maintenance cost of ordinary mud valves.

In reply to your question relative to the service we are getting from Flex-Seal mud valves, let me state that we believe them to be far superior to conventional mud valves, both from the standpoint of economy and operating efficiency. We are now replacing all conventional valves and plug valves with your Flex-Seal valves as replacements are needed on our eight rigs.

Yours very truly,
ALLEN & MORRIS
BY

JSM-pc

Here is additional proof of the remarkable low up-keep cost of Cameron Flex-Seal Mud Valves. But economical maintenance is only one of several reasons why more and more operators are replacing conventional mud valves and stop cocks with this unique valve.

The Cameron Flex-Seal Mud Valve may be easily opened and closed under full rated pressure. Trash on the seat does not prevent a pressure-tight seal, because the resilient seat readily embeds any foreign matter when the gate is closed. You don't need a big inventory of extra valves because the Cameron Flex-Seal Mud Valve may be easily and quickly overhauled at the rig by any member of the drilling crew. No special tools are required.

Write for complete mechanical details and specifications, or, better still, install a few Cameron Flex-Seal Mud Valves on your rig and observe first hand their numerous operating and money-saving advantages.

CAMERON IRON WORKS, Inc.

711 MILBY ST. HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y.
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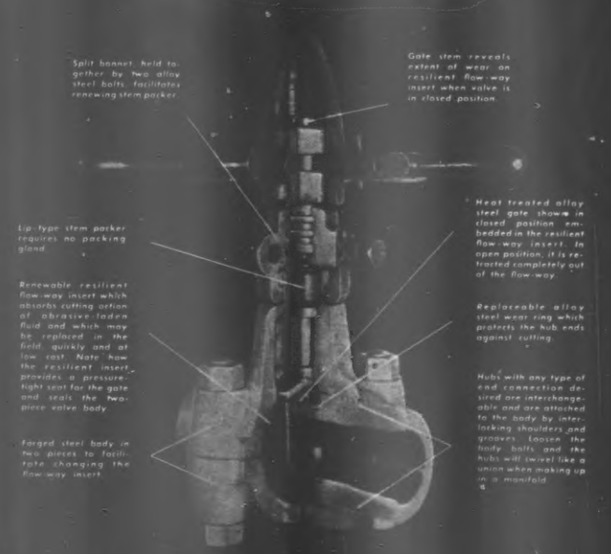

Split bonnet, held together by two alloy steel bolts, facilitates renewing stem packer.
Gate stem reveals extent of wear on resilient flow-way insert when valve is in closed position.
Lip-type stem packer requires no packing gland.
Heat treated alloy steel gate shown in closed position embedded in the resilient flow-way insert. In open position it is retracted completely out of the flow-way.
Renewable resilient flow-way inset which absorbs cutting action of abrasive-laden fluid and which may be replaced in the field quickly and at low cost. Note how the resilient insert provides a pressure-tight seat for the gate and seals the two-piece valve body.
Replaceable alloy steel wear ring which protects the hub ends against cutting.
Forged steel body in two pieces to facilitate changing the flow-way insert.
Hubs with any type of end connection desired are interchangeable and are attached to the body by interlocking shoulders and grooves. Loosen the body bolts and the hubs will swivel like a union when making up in a manifold.

Now Available in 4000 lb. Test Model Similar to This 6000 lb. Test Model

Weather Conditions Reduce Completions in Basin

By STAFF CORRESPONDENT

MATTOON, Ill., Nov. 17.—The effect of continued wet weather and muddy roads was again reflected in Illinois oil field operations last week by a sharp decline in completions. A total of 51 tests was completed, 35 less than during the preceding 7-day period. Oil-field activity during the week was also featured by the failure of important wildcat tests in Marion and Perry counties.

The first of the tests to prove disappointing was Paul Doran and Frank Buttram 1 Morgan, SE NW NE 12-4n-2e, Marion County test which was abandoned after an electrical log failed to show promise of production. Running low from the start, the test failed to encounter as much as a show of oil. The Fredonia was topped 2,225 ft., and hole was bottomed at 2,237 ft.

The second of the wildcats was even more disappointing. It was G. H. Blankenship 1 Herbert H. George, NW NE SW 23-4s-1w, Perry County. This test proved just the opposite of 1 Morgan by topping all formations high. The only oil shows encountered were in the Benoist and Aux Vases, and neither of these was of commercial value.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Dale	4	653	12,168
Johnsonville	3	1,046	9,574
Louden	2	500	6,042
New Harmony	3	452	8,619
Parkersburg	2	1,747	6,280
Rural Hill	4	2,328	13,067
Other pools	13	1,605	33,941
Wildcats	2	216	5,177
Dry holes: Fields	*9	.....	19,154
Wildcats	*9	.....	20,151
Total	51	.....	134,173
Recompletions	3	1,375	.....
Gas-input wells	1	.....	1,618

*Dundas 1, East Inman 1, Mill Shoals 1, Mount Carmel 1, Omaha 1, South Lawrence 1, West Centralia 1, Westfield 1, Woodlawn 1.

Jasper County Wildcat May Open New Pool

Ten miles south and some east of Newton, oil men were hailing a new pool opener in Jasper County last week after a drill-stem test in the McClosky recovered 1,200 ft. of oil and no water at the rank wildcat, Craft-Powers 1 Wade, W¼ SW NW 5-5n-14w. The McClosky was topped at 2,829 ft. and the hole was bottomed at 2,839 ft. Good gas pressure was reported in the well. No. 1 Wade is 6 miles east of nearest production in the Dundas Consolidated field.

Wildcats Show Promise In Several Areas

A Carter Oil Co. wildcat north of Mattoon in Coles County, 1 Haybrook, E½ SE SW 2-13n-7e, has set casing to test Aux Vases saturation at 1,830-42 ft. On a drill-stem test, 150 ft. of oil and 240 ft. of oil-cut mud were recovered. The county's only producer is a well drilled more than 2 years ago, Carter 1 Seeman, south of Mattoon. Another Coles County test 2½ miles south of 1 Seeman, Williams 1 Alexander. W½ NE NE 16-11n-7e, has set surface casing.

A wildcat northwest of Eldorado in Saline County, F. H. Summers 1 Roberts, SE SW NE 6-8s-7e, is drilling below 3,000 ft. in or very near the McClosky after unsuccessfully testing the Aux Vases sand at 2,953-72 ft. In early tests of the Aux Vases, mud and water and a slight amount of oil were recovered.

Casing has been set at a wildcat 7 miles west of the West Fairfield pool, Swan-King 1 Spencer, W½ SE NE 28-1s-6e, Wayne County, to test McClosky saturation. On a drill-stem test at 3,166-3,219 ft., 598 ft. of oil-cut mud was recovered in 25 minutes. The Aux Vases at 3,040-58 ft. was not favorable.

ILLINOIS COMPLETIONS

Wildcats

Adams County: O. A. Reed 1 Phillips, N½ SE NE SE 19-2s-6w, dry at 995 ft., Mississippian 114 ft., Kinderhook 339 ft., Maquoketa 537 ft., Trenton 715 ft.

Bond County: Fox & Conrey 1 Birkenstock, NE NW SW 11-4n-2w, dry at 1,244 ft., Glen Dean 958 ft., Benoist 1,232 ft.

Champaign County: C. Robinson 1 Springer, NW NW SW 18-22n-8e, dry at 1,400 ft., Devonian 289 ft., Silurian 313 ft., Maquoketa 1,057 ft., Trenton 1,255 ft.

Franklin County: Schlafly 1 Rovart, SW SE NE 15-5s-1e, dry at 3,016 ft., Kincaid 1,705 ft., Palestine 1,834 ft., Menard 1,980 ft., Glen Dean 2,195 ft., Barlow 2,410 ft., Ste. Genevieve 2,780 ft., Aux Vases 2,705 ft., Rosiclare 2,800 ft., Fredonia 2,844 ft., McClosky 2,860 ft., St. Louis 3,004 ft.

Peabody Coal 1 fee, NW NW NW 7-7s-3e, location abandoned.

Oil Carrier's, Inc., 1 Simms heirs, SE SE SW 29-7s-1e, location abandoned.

Oil Carriers, Inc., 1 Franklin County Coal, SW SW SE 28-7s-1e, dry at 2,741 ft., base Pennsylvanian 2,395 ft., Menard 1,707 ft., Glen Dean 1,933 ft., Cypress 2,224 ft., Cypress sand 2,245 ft., Paint Creek 2,336 ft., Ste. Genevieve 2,550 ft., Fredonia 2,688 ft.

Jefferson County: Union Mining 1 Blackward, SE SE NE 23-3s-4e, dry at 3,285 ft., base Pennsylvanian 1,928 ft., Degonia 1,938 ft., Menard 2,216 ft., Waltersburg 2,293 ft., Vienna 2,366 ft., Tar Springs 2,370 ft., Glen Dean 2,470 ft., Hardinsburg 2,502 ft., Golconda 2,570 ft., Barlow 2,720 ft., Cypress 2,726 ft., Cypress sand 2,772 ft., Paint Creek 2,828 ft., Benoist 2,881 ft., Renault 2,910 ft., Aux Vases 2,995 ft., Ste. Genevieve 3,032 ft., McClosky 3,142 ft.

Ledbetter-Gardenhire 1 Logan, E½ NW SW 15-4s-4e, dry at 3,395 ft., base Pennsylvanian 2,090 ft., Degonia 2,174 ft., Clore 2,248 ft., Palestine 2,324 ft., Menard 2,412 ft., Waltersburg 2,494 ft., Vienna 2,557 ft., Tar Springs 2,560 ft., Glen Dean 2,640 ft., Hardinsburg 2,690 ft., Golconda 2,734 ft., Barlow 2,863 ft., Cypress sand 2,888 ft., Paint Creek 3,001 ft., Benoist 3,048 ft., Renault 3,086 ft., Aux Vases 3,164 ft.

Richland County: Nolf et al 1 Nuding, NW SW NW 6-4n-14w, pumped 200 bbl. oil and 48 bbl. water, 500 gal. acid, McClosky 3,028-36 ft., T.D. 3,041 ft.

St. Clair County: Burgess 1 Eidman, NW SW SE 18-1s-6w, dry at 709 ft., Cypress 485 ft., Cypress sand 504 ft., Paint Creek 590 ft., Benoist 650 ft.

Wayne County: Albright 1 Collins, NW NW SE 24-1s-9e, dry at 3,360 ft., Menard 2,452 ft., Waltersburg 2,550 ft., Vienna 2,584 ft., Tar Springs sand 2,610 ft., Glen Dean 2,713 ft.

White County: Continental 1-A G. P. Hanna, SW SW NE 32-5s-10e, pumped 16 bbl., 5-qt. shot 2,093-98 ft., Kincaid 2,029 ft., Degonia 2,121 ft., T.D. 2,136 ft., P.B. 2,105 ft.

Allen & Selverson 1 C. Ford et al, NE NE NE 13-5s-10e, location abandoned.

Fields

Allendale, Wabash County: Joe Young 11 Stilwell, NW NE SE 1-1n-12w, pumped 30 bbl. oil and 5 bbl. water, 40-qt. shot 2,020-26 ft., Benoist 2,028-35 ft., T.D. 2,040 ft.

Alma, Marion County: Swan-King 2 Kotva heirs, SW SW NW 36-4n-2e, pumped 213 bbl. oil and 2 bbl. water, perf. 1,934-42 ft., old well P.B. from 2,110-1,944 ft.

Clay City, Wayne County: Pure 3-B M. Harrington, E½ NE SE 11-1n-7e, flowed 1,162 bbl., perf. 3,030-40 ft., Rosiclare 3,032-39 ft., old well worked over, T.D. 3,101 ft.

Pure 2-C Harrington, W½ NW SW 12-1n-7e, pumped 208 bbl. oil and 2 bbl. water, 5,000 gal. acid, McClosky 3,057-60 ft., 3,067-78 ft., 3,083-85 ft., T.D. 3,102 ft.

Pure 2 W. S. Carson, W½ NE NE 11-1n-7e, pumped 34 bbl. oil and 54 bbl. water, 5,000 gal. acid, McClosky 3,048-50 ft., 3,058-63 ft., T.D. 3,080 ft.

Dale, Hamilton County: Texas 7 R. R. Johnson, NW NE NE 13-6s-6e, swabbed 227 bbl., 5-qt. shot 3,096-98 ft., Aux Vases pay 3,089-94 ft., T.D. 3,099 ft.

Shell 6 Daily, NE NE NE 12-6s-6e, pumped 172 bbl., 25-qt. shot 2,991-3,008 ft., Aux Vases pay 2,982-3,000 ft., T.D. 3,032 ft.

Carter 3 Hale, SE SE NW 1-6s-6e, pumped 118 bbl., 300-qt. shot 2,994-3,022 ft., Aux Vases 2,967-92 ft., pay 2,992-3,001 ft., T.D. 3,027 ft.

Texas 11 M. Davis, NE NE NE 7-6s-7e, pumped 136 bbl., 20-qt. shot 2,998-3,008 ft., Aux Vases 2,963 ft., T.D. 3,010 ft.

Dundas, Jasper County: Pure 1 F. G. Wright, N½ NE NW 32-5n-10e, dry at 2,900 ft., Barlow 2,470 ft., Aux Vases 2,789 ft., Ste. Genevieve 2,809 ft., Rosiclare 2,830 ft., Fredonia 2,843 ft.

Pure 2 J. Benefield, S½ SW NW 9-5n-10e, flowed 130 bbl., 5,000 gal. acid, McClosky 2,759-66 ft., T.D. 2,800 ft.

Griffin, White County: Wabash O. & G. 5 Reeves heirs, NW SW SE 28-3s-14w, pumped 20 bbl., 40-qt. shot 2,780-94 ft., perf. 2,216 ft., 2,550-76 ft., Aux Vases 2,771-92 ft., Cypress sand 2,557-77 ft., Tar Springs 2,214-24 ft., T.D. 2,800 ft.

Inman, Gallatin County: Oil Management, Inc., 7 Egyptian T. & T., NE SE SE 16-8s-10e, pumped 135 bbl., 24-qt. shot 2,399-2,415 ft., Weller 2,387 ft., T.D. 2,415 ft.

Inman East, Gallatin County: Ritchey 2 Frey, SW SE NE 19-8s-10e, dry at 2,868 ft., Kincaid 1,691 ft., Palestine 1,844 ft., Menard 1,932 ft., Waltersburg 2,022 ft., Vienna 2,100 ft., Tar Springs 2,162 ft., Glen Dean 2,222 ft., Golconda 2,298 ft., Barlow 2,427 ft., Cypress 2,443 ft., Cypress sand 2,473 ft., Paint Creek 2,580 ft., Benoist 2,609 ft., Renault 2,662 ft., Aux Vases 2,739 ft., Ste. Genevieve 2,770 ft.

Johnsonville, Wayne County: United Prod. 1 Schofield, N½ SE SE 34-1n-6e, pumped 148 bbl., 5,000 gal. acid, McClosky 3,131-39 ft., 3,141-45 ft., T.D. 3,200 ft.

Texas 2 O. Shehorn, N½ NW NW 27-1n-6e, pumped 98 bbl., 4,000 gal. acid, McClosky 3,114-24 ft., T.D. 3,210 ft.

C. Beck 1 M. Bailey, S½ NE SE 26-1n-6e, flowed 800 bbl., 500 gal. acid, McClosky 3,150-61 ft., T.D. 3,164 ft.

Louden, Fayette County: Carter 1-D Carter-Rudman, NW NE 28-8n-3e, flowed 250 bbl., 100 gal. acid, Devonian 2,921 ft., pay 2,997 ft., T.D. 3,009 ft.

Carter 27-4 Rhodes, SE SE NW NE 27-8n-3e, gas-input well, perf. 1,547-74 ft., 1,586-1,600 ft., Glen Dean 1,325 ft., Cypress 1,494 ft., Paint Creek 1,550 ft., Benoist 1,591 ft., T.D. 1,618 ft., P.B. 1,594 ft., drilled out to 1,610 ft.

Carter 3-D Durbin, SW SW 22-8n-3e, flowed 250 bbl. through choke, 100 gal. acid, Devonian 2,946 ft., T.D. 3,033 ft.

Mill Shoals, White County: Hudson-Hess 4 A. J. Poorman, NE NW NE 30-3s-8e, pumped 366 bbl., 80-qt. shot 3,189-3,223 ft., Ste. Genevieve pay 3,189-3,223 ft., T.D. 3,223 ft.

Mill Shoals, Hamilton County: Texas 2-B Poorman, SE NE SE 24-3s-7e, dry at 3,451 ft., Glen Dean 2,620 ft., Hardinsburg 2,700 ft., Golconda 2,787 ft., Barlow 2,900 ft., Cypress 2,910 ft., Paint Creek 3,055 ft., Benoist 3,090 ft., Renault 3,150 ft., Aux Vases 3,238 ft., McClosky 3,360 ft., St. Louis 3,447 ft.

Mount Carmel, Wabash County: L. E. Kennedy et al 4 Carson, N½ SE SW 16-1s-12w, pumped 300 bbl., 2,000 gal. acid, McClosky 2,316-22 ft., T.D. 2,322 ft.

Olds et al 1 Risley, SE SW NW SW 21-1s-12w, pumped 60 bbl. oil and 50 bbl. water, 50-qt. shot 2,038-53 ft., Cypress sand 2,038-53 ft., T.D. 2,053 ft.

First Nat. Pet. Trust 1-B Guard, NE NW NW SE 21-1s-12w, dry at 1,998 ft., Biehl sand 1,496 ft., Glen Dean 1,770 ft., Golconda 1,858 ft., Barlow 1,961 ft., Cypress sand 1,982 ft.

New Harmony, White County: Superior 18 H. E. Given, SE NW SW 34-4s-14w, pumped 320 bbl. from Benoist and McClosky, 90-qt. shot 2,708-18 ft., milled casing 2,697-99 ft., Benoist 2,697-2,745 ft., McClosky 2,883-86 ft., T.D. 2,900 ft.

Superior 25-A E. M. Fitten, NE NE NE 32-4s-14w, pumped 25 bbl., 40-qt. shot 2,840-56 ft., 20-qt. shot 2,599-2,605 ft., 190-qt. shot 2,840-56 ft., Cypress sand 2,590-2,630 ft., Benoist 2,726-79 ft., Aux Vases 2,840-54 ft., T.D. 2,860 ft.

Superior 9 Greathouse, SE NW NE 4-5s-14w, pumped 107 bbl., 80-qt. shot 2,832-53 ft., 20-qt. shot 2,592-96 ft., perf. 2,680-89 ft., 2,693-2,707 ft., 2,716-32 ft., Cypress 2,582 ft., Cypress sand 2,685 ft., Paint Creek 2,694-2,763 ft., Aux Vases 2,839-59 ft., T.D. 2,859 ft.

North Boos, Jasper County: Pure 2 J. T. May, NE NW SW 8-6n-10e, flowed 203 bbl., 5,000 gal. acid, McClosky 2,758-68 ft., 2,777-80 ft., 2,783-85 ft., 2,790-95 ft., T.D. 2,800 ft.

Omaha, Gallatin County: Texas 1 G. Edwards, SE SE NE 5-8s-8e, dry at 2,807 ft., Hardinsburg 2,080 ft., Weiler 2,284 ft., Benoist 2,402 ft., McClosky 2,738 ft., St. Louis 2,801 ft.

Parkersburg, Richland County: Ohio 1 E. A. Stevens, E½ SE SE 30-2n-14w, flowed 1,331 bbl., 19 per cent water, 5,000 gal. acid, McClosky 3,125-29 ft., T.D. 3,129 ft.

Ohio 2 C. O. Clodfelter, S½ SW SW 29-2n-14w, flowed 416 bbl., 2,000 gal. acid, reacid, McClosky 3,112-18 ft., 3,124-33 ft., T.D. 3,151 ft.

Parkersburg, Edwards County: Central P. L. 1 Ridgley, E½ NW SE 31-2n-14w, location abandoned.

Rising Sun, White County: Herndon Drlg. 1 Nibling, NW SW SW 18-6s-11e, location abandoned.

Cherry & Kidd et al 5 Karch, NW SW SE 13-6s-10e, pumped 30 bbl. in 15 hr., pumped off, 80-qt. shot 1,367-77 ft., 205-qt. shot 1,373-85 ft., Bridgeport 1,367 ft., T.D. 2,240 ft., P.B. 1,390 ft.

Rural Hill, Hamilton County: Shell 2 J. F. Crabtree, NW NE SE 14-6s-5e, flowed 548 bbl. in 19½ hr., 3,000 gal. acid, Ste. Genevieve 3,152 ft., pay 3,186-3,202 ft., T.D. 3,302 ft.

Kenawee 2 Culpepper, NE SW SE 14-6s-5e, flowed 521 bbl., 40-qt. shot 3,092-3,119 ft., Aux Vases 3,084-3,119 ft., T.D. 3,119 ft.

Reward and Texas 2 Smith-Knight, SE NW NE 13-6s-5e, flowed 875 bbl., 5-qt. shot 3,099-3,126 ft., Aux Vases 3,087 ft., T.D. 3,345 ft.

Magnolia 5 Sloan, NE SE NW 13-6s-5e, flowed 384 bbl. from Levias and McClosky, perf. 3,188-3,203 ft., 2,000 gal. acid, Levias 3,190-3,201 ft., T.D. 3,388 ft.

South Lawrence, Lawrence County: Chet. Evans 1 Spiedel, NW NE NW 26-2n-12w, dry, old well deepened from 1,380-90 ft.

C. Evarts 2 Catt, NE NW NW 26-2n-12w, dry at 1,405 ft.

Walpole, Hamilton County: Texas 1 G. T. Johnson, NW SW SW 26-6s-6e, pumped 35 bbl., 20-qt. shot 3,086-

(Continued on Page 88)

Posey County Discovery in Waltersburg to Test Cypress

By STAFF CORRESPONDENT

EVANSVILLE, Ind., Nov. 17.—Carter Oil Co. last week plugged off the Waltersburg sand in their Posey County wildcat, 1 Maier, N½ NE SW 1-7s-14w, after the well swabbed 90 bbl. in 8 hours from that formation. A perforation was made opposite the Waltersburg to test a cement squeeze job but the well immediately began producing. The perforation was cemented, however, and the company is following its original plan in first thoroughly testing Cypress saturation at 2,441-77 ft. The Waltersburg saturation was encountered at 1,965-2,015 ft.

Due for a production test in the near future is a wildcat between Mount Carmel, Ill., and Patoka, Ind., R. D. Brown 1 Harry Antell, NE SE 20-1s-11w, Gibson County, which is now shut down while storage tanks are being erected. No. 1 Antell filled with oil in 30 minutes after 4 ft. of McClosky saturation was drilled. The test, 1 mile south of a good gas well completed more than a year ago, was drilled with cable tools. Saturation was found at 2,258-62 ft. Nearest production is in the old West Princeton field, approximately 4 miles southeast of 1 Antell.

INDIANA COMPLETIONS

Wildcats

Jasper County: Nat. Pet. 1 Wortley, SW SW 19-28n-6w, dry at 1,059 ft., Trenton 957 ft.

Gibson County: Bert Fields 2 Hall, SE NW SW 31-2s-12w, dry at 1,112 ft.

Posey County: Cherry & Kidd et al 1 Gugger, NE NE NE 7-7s-14w, dry at 2,951 ft., Renault 2,699 ft., Aux Vases 2,750 ft., Ste. Genevieve 2,800 ft., St. Louis 2,945 ft.

Spencer County: J. B. Miller et al 1 Dooley, NW NE NW 19-7s-7w, dry at 1,045 ft.

Fields

Bufkin South, Posey County: Central States 2 Seifert, N½ NE NW NW 30-6s-12w, location abandoned.

Griffin, Gibson County: Bander et al 43 Cooper, NE SW SE 13-3s-14w, location abandoned.

Bander et al 45 Cooper, NE SE NW 19-3s-13w, location abandoned.

Bander et al 44 Cooper, NE SE NE 13-3s-14w, location abandoned.

Hatfield, Spencer County: L. L. Benoist et al 2 Abbott, SW NE NW 7-7s-7w, pumped 100 bbl., T.D. 1,039 ft.

Jesse Wilson et al 1 B. A. Miller, S½ SW NE NE 6-7s-7w, dry at 1,059 ft., water 1,045-50 ft.

St. Wendells, Posey County: K. R. Bixby et al 4 Luigs. SW SW SE 14-5s-12w, pumped 20 bbl.

Miscellaneous, Daviess County: R. D. Brown, Inc., 1 fee, N½ SW NE 21-2n-6w, 550,000 cu. ft. gas, Cypress 722 ft., show gas 728-29 ft., pay 732-40 ft., T.D. 742 ft.

OHIO

ZANESVILLE, Ohio., Nov. 17.—A promising eastern Ohio test is a failure at 5,875 ft. The Ohio Oil Co. 1 James T. Phillips, Section 33, Washington Township, Harrison County, logged the Clinton sand at 5,698-5,771 ft. and 5,782-94 ft., 40,000 cu. ft. gas showing at 5,733 ft., Red Medina 5,865 ft., plugged at 5,875 ft. The test was the eastern offset to a fair gas well completed previously by the East Ohio Gas Co.

Benedum & Trees are having difficulty cleaning out after shooting a small gas and oil showing in their M. Chapman test in Section 8, Monroe Township, Harrison County. The Clinton was logged at 5,420-61 ft., small show gas 5,420-21 ft., show oil 5,430-32 ft., total depth 5,614 ft.

Preston Oil Co. 1 Margaret Shaw, Section 8, Clayton Township, Perry County, gives promise of being a fair producer. The 6⅝-in. casing filled up 1,500 ft. with oil while drilling the Clinton at 3,259-98 ft., still drilling.

Licking and Meigs counties yield fair gas wells.

OHIO COMPLETIONS

Athens County

Ames Township: Charles D. Mosher et al 15 Lena L. Bean, Sec. 13, 3 mi. S of Amesville, 8 bbl. before shot, first Cow Run, T.D. 349 ft.

Bern Township: Ohio Fuel 1 F. M. McCune, Sec. 26, dry, Berea, T.D. 1,736 ft.

Cuyahoga County

Parma Township: Obermiller 1 A. Schmidt, Lot 16, dry, Clinton, T.D. 3,111 ft.

Coshocton County

Perry Township: Murphy Pet. Co. 7 W. D. Mossholder, Sec. 15, 40 bbl., shot Clinton 3,090-3,150 ft., T.D. 3,151 ft.

Gallia County

Addison Township: Ohio Fuel 1 Chas. Bradley, Sec. 25, 30,000 cu. ft. gas, shot, second Berea, T.D. 1,652 ft.

Holmes County

Prairie Township: Ohio Oil Co. 1 F. H. Oats, West Sec. 24, dry, through Clinton sand, T.D. 3,689 ft.

Knox County

Union Township: Upham Gas Co. 1 Perry Conkie, Sec. 19, dry, Clinton, T.D. 3,139 ft.

Lawrence County

Windsor Township: Pawnee Corp. 1 J. H. Ellis, Sec. 15, 130,000 cu. ft. gas, shot, Ohio shales, T.D. 2,804 ft.

Licking County

Madison Township: Ohio Fuel 1 Bertha Phillips, Lot 8, second quarter, 1,500,000 cu. ft. gas, Clinton 2,657-91 ft., T.D. 2,698 ft.

Ray Penick 1 Winfred Jones, second quarter, 300,000 cu. ft. gas, shot, Clinton 2,446-81 ft., T.D. 2,487 ft.

Mary Ann Township: Pat Oil & Gas Co. 3 Harriet Newlon, Sec. 6, 3-bbl. pumper, Berea, T.D. 735 ft.

H. G. Lightner 4 fee, Sec. 6, 4-bbl. pumper, Berea, T.D. 650 ft.

Newark Township: National Drlg. Co. 1 Clyde Clagget, 880,000 cu. ft., shot, Clinton, 2,301-27 ft., T.D. 2,332 ft.

Lorain County

La Grange Township: Ohio Fuel 1 Ezra Frye, Lot 57, dry, no Clinton sand, T.D. 2,435 ft.

Medina County

Spencer Township: H. C. Bishop 1 Frank White, Sec. 14, dry, Clinton, T.D. 2,586 ft.

Meigs County

Orange Township: Ohio Fuel 1 J. E. White, Sec. 36, dry, Gordon, T.D. 2,194 ft.

Rutland Township: Nolan Shuster 6 Arthur Nelson, Sec. 22, 1,000,000 cu. ft. gas, Maxon, T.D. 906 ft.

Monroe County

Bethel Township: Hope Construction & Refining 3 S. W. Simmons, Sec. 29, 790,000 cu. ft. gas, second Cow Run, T.D. 1,127 ft.

Henning Bros. et al 2 Forrest Simmons, NE Sec. 29, 600,000 cu. ft. gas, Injun sand, T.D. 1,610 ft.

Franklin Township: Hines 7 Gardner 2 Preston Gardner, Sec. 1, 12 bbl., shot, Squaw, T.D. 1,493 ft.

A. E. Robinson 6 Wm. Nickels, Sec. 7, 5 bbl., Keener, T.D. 1,198 ft.

Baker Oil Co. 13 Herman Baker, Sec. 10, dry, Squaw, T.D. 1,333 ft.

Seneca Township: Spangler & McCort 1 J. W. Christman, Sec. 36, 25,000 cu. ft. gas, T.D. 1,865 ft.

Washington Township: Harold Spence 1 fee, Sec. 18, ¼-bbl. pumper, Keener, T.D. 1,500 ft.

Morgan County

Homer Township: D. T. Orndoff 4 Sarah V. Dale, Sec. 2, 200,000 cu. ft. gas, Macksburg 500 ft., T.D. 382 ft.

Muskingum County

Blue Rock Township: Industrial Gas Corp. 2 Robert H. Finley et al, SW Sec. 8, 38 bbl. in 48 hr. with 200,000 cu. ft. gas, through Medina, T.D. 4,130 ft.

Newton Township: Atha Co. 2 Ralph Thompson, Sec. 12, dry, Clinton 3,320-59 ft., T.D. 3,559 ft.

Noble County

Jefferson Township: Andrew K. Cline 19 George Rupp, SW Sec. 10, 3 bbl., Berea, T.D. 1,780 ft.

Noble Township: Fassett Oil Co. 3 E. L. Long, Sec. 34, show oil and gas, Macksburg 300 ft., may use for repressuring, T.D. 180 ft.

Perry County

Monroe Township: Preston Oil 1 Emma Marshall, Sec. 30, dry, Clinton, T.D. 3,747 ft.

C. Z. Ruth 21 North West Coal Co., SW Sec. 22, 6 bbl. after shot, Berea, T.D. 1,114 ft.

Tuscarawas County

Lawrence Township: East Ohio 1 W. Garber, Sec. 3, 42,000 cu. ft. gas, shot, Clinton, plugged, T.D. 4,643 ft.

Washington County

Aurelius Township: Ames Co. 14 J. M. Daw, Sec. 21, 2 bbl., shot, Berea, T.D. 1,765 ft.

Dunham Township: McTaggert 3 A. F. Male, Sec. 12, dry, Maxon, T.D. 1,444 ft.

Independence Township: W. C. Patterson 6 David Wostell, SW Sec. 18, 2½ bbl., Keener, T.D. 1,441 ft.

Liberty Township: Graham Oil Co. 1 Ludwig Schenkel, SW Sec. 4, 8-bbl. pumper, Maxton sand, T.D. 1,405 ft.

DePuy Bros. 7 W. H. Winland, Sec. 4, dry, Berea, T.D. 1,921 ft. (old well deepened from Injun).

Warren Township: R. W. Porter et al 14 fee, Lot 518, 400,000 cu. ft. gas, Macksburg 800 ft., T.D. 1,260 ft.

Wayne County

Franklin Township: Dave Shaffer 1 Simon Sprowls, Sec. 21, 220,000 cu. ft. gas, shot, Clinton, T.D. 3,473 ft.

Wood County

Bloom Township: C. H. Schwyer 1 A. I. Wittaker, Sec. 7, 5 bbl., shot, Trenton, T.D. 1,380 ft.

SUMMARY OF COMPLETIONS

Indiana

	No.	Bbl.	Footage
Oil wells	2	120	2,078
Gas wells	1	*0.6	742
Dry holes	5	.....	7,226
Total	8	.....	10,046

Ohio

	No.	Bbl.	Footage
Oil wells	14	137	22,091
Gas wells	12	*6.1	22,016
Dry holes	14	.....	43,207
Total	40	.....	87,314

Eastern Kentucky

	No.	Bbl.	Footage
Oil wells	1	1	825
Gas wells	3	*0.7	7,555
Total	4	.....	8,480

Western Kentucky

	No.	Bbl.	Footage
Oil wells	4	50	2,927
Gas wells	1	*0.1	1,187
Dry holes	8	.....	6,723
Total	13	.....	10,837

*Million cu. ft.

EASTERN KENTUCKY

ASHLAND, Ky., Nov. 17.—Four gas wells and a small oil well were included in the report of eastern Kentucky operations this week. For the first time in several months reports of new locations were lacking and drilling operations are continuing on the same level as in recent weeks. The four gas wells have a combined open-flow production of 865,000 cu. ft. of gas daily.

Magoffin County

Affiliated Oil Properties 4 Paris McCarty, 1 bbl. at 925 ft.

Pike County

Kentucky-West Virginia 649 Norma Cornett et al, on Brushy Fork, 286,000 cu. ft. gas, shale, T.D. 2,825 ft.

Knott County

Kentucky-West Virginia 5339 Wilburn Thacker, 253,000 cu. ft. gas from shale, R.P. 330 lb., at 2,900 ft.

Floyd County

Kentucky-West Virginia 5352 Vonie Swinney, on Long Branch, 126,000 cu. ft. of gas from Maxon, R.P. 550 lb., T.D. 1,830 ft.

S. C. Allen and Crate Rice are running tubing in the J. L. Preston well on Stave Branch in Johnson County. The well had an open flow of 200,000 cu. ft. of gas at a total depth of 2,424 ft. before shot. No report available since shot.

WESTERN KENTUCKY COMPLETIONS

Daviess County, Thruston district: Flem Douthitt 2 C. H. Abell, dry, T.D. 1,456 ft.

Maceo district: Anderson et al 1 B. Kendall, dry, T.D. 750 ft.

Birk City district: St. Louis Oil Producing & Refining Co. 2 Rosie L. Logsdon, dry, T.D. 1,342 ft.

Red Hill district: W. K. Snyder et al 4 Kate Shively, 125,000 cu. ft. gas, Jones sand 944-76 ft., T.D. 1,187 ft.

Barnett et al 4 Jim Woods, 15 bbl., 40-qt. shot, Jett sand 918-33 ft., T.D. 935 ft.

Cleopatra district: Redwing & Shaffer 1 John Woodward, abandoned location.

Hancock County, Floral district: Henry Scholl 14 S. B. Parrott, 5 bbl., 40-qt. shot, Jett sand 439-57 ft.

Henderson County, Niagara district: Schneider & Gwin 8 O. W. Overfield, 5 bbl., 20-qt. shot, stray sand 637-52 ft., T.D. 656 ft.

Muhlenberg County, Weir district: Dr. O'Neil 2 F. K. Jameson, dry, T.D. 1,141 ft.

H. A. Henry 6 H. F. Lee, dry, T.D. 800 ft.

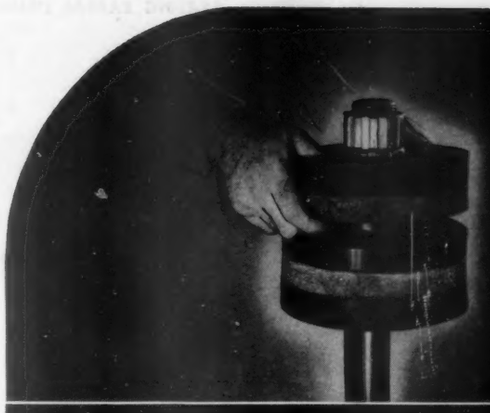
Ohio County, Fordsville district: Batton-Vickers 1 Charles Mason, dry, T.D. 267 ft.

Vickers et al 3 Richards heirs, dry through Jett sand, T.D. 615 ft.

Pleasant Ridge district: W. W. Wilkins 3 Addie Westerfield, 25 bbl., T.D. 878½ ft.

Pleasant Grove Church district: Harry Ogle 13 A. R Renfrow, dry, T.D. 352 ft.

MISSION SLUSH PUMP PISTONS



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MISSION
SLUSH PUMP PISTONS

Barton County Strike Spurs Pawnee Rock Exploration

By ROBERT INGRAM

THE Pawnee Rock pool on the eastern edge of Pawnee County and just touching the Barton County line, was looming last week as one of the major oil areas of the state. The area is well removed from the general western Kansas play and has been the focal point of an exploration campaign which has considerably extended the pool itself. Last week Helmerich & Payne, Inc., took a potential test on 1 P. A. Unruh, a wildcat in W½ SW NW 17-20-15w, 2 miles east of the Pawnee Rock pool, drew an initial of 583 bbl. a day. The pay is from Arbuckle dolomite from 3,814-19 ft.

Several attempts have been made in recent months to find production in this southwest corner of Barton County. The most recent was Central Petroleum and Aladdin Petroleum Corp. 1 Brewer, W½ SW NE 23-20-15w, 3½ miles southeast of the East Pawnee Rock pool (opened by Helmerich & Payne 1 Unruh), which was a dry hole last week at 3,726 ft. in the Arbuckle.

Development of the new area was starting at once. Early in the week, before the potential had been taken on the Unruh, Transwestern Oil Co. staked 1 Deckert, E½ SE NE 18-20-15w, as an offset, and other locations were expected soon.

Productive limits of the Pawnee Rock pool were extended ¼ mile south by Derby Oil Co. 1 Bixby, S½ NW SW 24-20-16w. The well made 62 bbl. of oil on an initial swabbing potential from Arbuckle dolomite at a total depth of 3,812 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	29	27,805	94,397
Wildcats	1	153	3,258
Gas wells: Fields	2	*13.7	2,927
Wildcats	1	*1.5	1,487
Dry holes: Fields	9	.....	27,345
Wildcats	7	.....	17,629
Total	49	.....	147,043
Recompletions	3	3,811	.....

*Million cu. ft.

Southeast Reno County Gets New Viola Lime Pool

Another new pool was opened last week, the thirty-sixth since January 1. It was 3½ miles northwest of the Hilger pool at J. Lloyd Carey, Seldon D. Butcher and Rocket Drilling Co. 1 Soper, N½ NE NW 30-25-4w. The well filled 900 ft. with oil in 5 hours after operators drilled out the cement plug. Crude tested 38 gravity and there was no water showing.

Viola lime, the producing formation, was topped at 3,981 ft., and originally penetrated 5 ft. with rotary tools before casing was set. Crews were to continue to bail and clean out the well before treating with acid sometime this week for completion.

Raymond Pool Lansing Zone Extended by Gusher

The Lansing-Kansas City lime series was assured a ⅝-mile northeastward oil extension in the Raymond pool of western Rice County by Holl & Branine, Wichita operators. Their 1 Warner, located in S½ E½ NE 16-20-10w, blew in at 5 o'clock Friday morning from a 2-ft. penetration with cable tools at 3,025 ft. in the Lansing series. The pipe was set at 3,023 ft.

No gage on production was reported Friday but the well assured new development in this shallow pay area. The Raymond pool, one of the earliest Arbuckle pools to be developed in Kansas, gained its Kansas City zone expansion principally this year.

Bornholdt-Welch Outpost Testing

Westgate-Greenland Oil Co. 1 Harder, semiwildcat, in N½ NW SW 36-20-6w, in Rice County, midway between the Barnholdt and Welch pools, failed to increase oil production in deepening to 3,405 ft. and operators were reported plugging back to 3,372 ft. for further testing. The Harder earlier had obtained some oil production and was put on the pump but after producing some 18 bbl. of oil pumped off and the decision to deepen was made.

Simpson Well Showing At Lake City Pool

Pryor & Lockhart 2 Gant-C, CNL NE 18-31-13w, apparently has opened a new producing horizon for the Lake City pool of Barber County in Southwest Kansas. The new test was making from 1 to 1½ bbl. of oil an hour from the Simpson sand. Other production in the pool is from the Arbuckle dolomite.

If the No. 2-C establishes commercial production from the Simpson it will be the first in Barber County from that horizon. The Pryor & Lockhart test cored from 4,528-41 ft. in the Simpson and obtained good shows. Pipe then was cemented on top of the horizon at 4,528 ft. Operators circulated for 3 days awaiting weather which would permit field work and when plug was drilled found only a rainbow of oil. However, after some swabbing, cleaning out and testing the hole began making from 1 to 1½ bbl. of oil an hour.

The 2-C Gant offsets the No. 1-C, pool producer from the Arbuckle.

KANSAS COMPLETIONS

Wildcats

Barton County: Central Petroleum et al 1 E. Unruh, E½ SE SE 9-20-15w, dry, T.D. 2,798 ft., anhydrite 995 ft., Topeka 3,077 ft., Lansing 3,414 ft., some show oil 3,495-3,520 ft., conglomerate 3,688 ft.. Arbuckle 3,726 ft.

Cowley County: Wakefield et al 1 Wilson, SW SW NW 7-32-4e, dry, T.D. 3,360 ft., base Stalnaker 2,085 ft., Kansas City 2,405 ft., Bartlesville zone 2,935 ft., Mississippi 3,034 ft., Arbuckle 3,352 ft.

Graham County: Cities Service 1 Barber, NE NE NE 27-9-22w, dry, T.D. 4,158 ft., anhydrite 1,813 ft., Neva 2,830 ft., Topeka 3,330 ft., Lansing 3,550 ft., Arbuckle 4,018 ft.

Jefferson County: Mosbacher et al 1 Bell estate, NW NE NE 12-10-20e, gaged 1,429,000 cu. ft. gas, R.P. 460 lb., Mississippi lime; Bartlesville 1,332 ft., broken sand 1,330-72 ft., Mississippi 1,372 ft., T.D. 1,487 ft., P.B. 1,459 ft., *extends McLouth pool.*

Kiowa County: Dr. August Ponath 1 Allerdice estate, NW NW NE 22-30-19w, rig abandoned.

McPherson County: Westgate-Greenland 1 Gustafson, S½ SE NW 5-17-1w, dry, T.D. 2,723 ft., Lansing 2,080 ft., Mississippi 2,691-2,723 ft.

Rice County: Hartman & Mitchell Drilling 1 Walstein, NW NW SE 8-21-6w, dry, T.D. 3,560 ft., anhydrite 1,020 ft., Lansing 2,930 ft., conglomerate 3,508-09 ft., Mississippi 3,541 ft., show oil at 3,543 ft.

Russell County: Eldorado Refining 1 Mohl, SE SE SE 18-14-13w, pumped 153 bbl., Gorham sand 3,253 ft., 7-in. 3,220 ft., T.D. 3,258 ft., Topeka 2,685 ft., Lansing 2,980 ft.

Thomas County: John Ackard 1 Murphy, SE SE NE 24-7-34w, dry, T.D. 428 ft.

John Ackard 2 Murphy, SE SE SE 24-7-34w, dry, Dodge shale 402 ft., T.D. 602 ft.

Fields

Ainsworth, Barton County: Stanolind 5 Morrison-A, W½ E½ SW 27-16-13w, pumped 3,000 bbl., Arbuckle 3,412 ft., 5-in. 3,412 ft., T.D. 3,415 ft.

Northwest Ainsworth, Barton County: Continental 1 Redetzke, SE SW SW 20-16-13w, pumped 231 bbl. oil and 7 bbl. water, Arbuckle 3,387 ft., acid, T.D. 3,399 ft.

Beaver, Barton County: Hinkle et al 1 Depiesse, S½ SW SE 5-16-12w, dry, T.D. 3,393 ft., Lansing 3,047 ft., cherty conglomerate 3,316 ft., no Arbuckle.

Bemis, Ellis County: Cities Service 11 McCord, SE SE NE 26-11-17w, pumped 3,000 bbl., Arbuckle 3,585 ft., 5-in. 3,542 ft., acid, shot, T.D. 3,598 ft.

Burnett, Ellis County: Dickey Oil 2 Carmichael, N½ SW SW 8-11-17w, pumped 623 bbl., Arbuckle 3,377 ft., 7-in. 3,377 ft., acid, T.D. 3,382 ft.

Chase, Rice County: McPherson Drilling 2 Cannon, SW NW SE 8-19-9w, pumped 957 bbl., Arbuckle 3,240 ft., 5-in. 3,240 ft., acid, T.D. 3,249½ ft.

C. H. Weaver 1 Schroeder estate, S½ SW NE 18-19-9w, dry, T.D. 3,346 ft., no Arbuckle.

Coralena, Russell County: Helmerich & Payne 2 Sylva, S½ NE NW 20-15-13w, pumped 501 bbl., Lansing 3,010-14 ft. and 3,020-28 ft., 5-in. 3,287 ft., acid and shot, T.D. 3,287 ft.

Cunningham, Pratt County: Skelly 2 Steffen-C, N½ SW NE 35-27-11w, flowed 2,640 bbl. oil and 360 bbl. water, Lansing 3,467-77 ft., 5½-in. 3,729 ft., acid and shot, T.D. 3,730 ft.

Skelly 4 Leisman, SE NE NW 29-27-10w, old well, old T.D. 3,459 ft., Lansing 3,424 ft., T.D. 3,459 ft., flowed 179 bbl. oil and 11 bbl. water.

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	Nov. 15	Nov. 8
Augusta	1,250	1,250
Bemis-Shutts	8,850	11,350
Bloomer	7,100	6,350
Burnett	11,700	10,250
Burrton	7,200	7,100
Chase	6,350	5,700
Elbing	950	900
El Dorado-Towanda	7,150	7,200
Geneseo	6,850	5,250
Graber	2,800	2,750
Greenwood County	9,050	9,000
Hollow-Nikkel	1,450	1,400
Keesling-Midway	950	1,050
Lerado	850	700
Lorraine	1,400	1,450
Oxford	500	500
Rainbow Bend	900	950
Raymond	1,450	950
Ritz-Canton	3,800	3,700
Trapp	22,450	19,950
Balance Russell County	25,550	25,950
Sedgwick County	3,050	2,950
Silica	20,300	19,100
Voshell	850	800
Wellington	850	800
Wherry	2,400	2,400
Zenith	11,550	11,050
Others	87,200	77,350
Total Kansas	255,550	238,950

Davidson, Barton County: H. H. Blair 2 Peirano, N½ NW NE 4-16-11w, pumped 371 bbl., Lansing 3,063 ft., 7-in. 3,063 ft., acid, T.D. 3,079 ft.

Dayton, Phillips County: Carter 1 Eltiste, SE NE 35-2-19w, Lansing 3,158 ft., pumped 142 bbl. oil and some water in 8 hr., 34.7-gravity, potential 426 bbl., 5-in. 3,410 ft., T.D. 3,545 ft.

Edwards, Ellsworth County: Continental 9 O. O. Fuller, SW SW SE 28-17-8w, pumped 516 bbl., Arbuckle 3,194 ft., 6-in. 3,195 ft., acid, T.D. 3,219 ft.

Feltes, Barton County: Lario Oil & Gas 1 N. Weber-B, S½ SW SE 11-16-12w, dry, T.D. 3,378 ft., Arbuckle 3,368 ft.

East Frog Hollow, Cowley County: Tulsa Oil et al 1 Moore, SE NE NE 15-32-5e, pumped 102 bbl., Bartlesville 3,063-84 ft., shot, T.D. 3,117 ft.

Geneseo, Rice County: Continental 4 Warner-A, NE SE NW 36-18-8w, pumped 3,000 bbl., Arbuckle 3,203 ft., 6-in. 3,204 ft., acid, T.D. 3,224 ft.

Greenvale, Russell County: Stanolind 1 Zeman, N½ NW NE 9-15-12w, pumped 958 bbl., Sooy sand 3,251-61 ft., 7-in. 3,246 ft., T.D. 3,261 ft.

Hall-Gurney, Russell County: Jones & Shelburne 4 Rein-A, S½ SE SW 27-14-13w, pumped 697 bbl., 35 per cent water, Lansing 2,848-65 ft., 7-in. 2,846 ft., acid, T.D. 2,917 ft.

Hewitt, Norton County: Helmerich & Payne and Phillips 2 Hewitt, S½ SW NE 11-4-21w, temporarily abandoned, T.D. 3,563 ft., Lansing 3,366 ft.

Keesling, Rice County: Luther P. Mackall et al 3 Mitchell, W½ NW SE 4-20-9w, pumped 60 bbl. oil and 60 bbl. water, Arbuckle 3,222 ft., 4-in. 3,233 ft., T.D. 3,245 ft.

Colorado Petroleum 3 Keesling-B, N½ S½ NW 10-20-9w, pumped 45 bbl. oil and 360 bbl. water, Arbuckle 3,218 ft., 5-in. 3,220 ft., T.D. 3,230 ft.

Kraft-Prusa, Barton County: Black-Marshall Oil 1 Schneweiss-B, SW SW NW 5-17-11w, pumped 1,100 bbl., Arbuckle 3,351 ft., 5-in. 3,350 ft., acid, T.D. 3,365 ft.

Shell 1 Gibler, SE SE SE 16-17-11w, pumped 2,743 bbl., Arbuckle 3,257 ft., 4-in. 3,258 ft., acid, T.D. 3,264 ft.

Krier, Barton County: Skelly 6 Esfield, E½ SW NE 30-16-11w, pumped 278 bbl. oil and 27 bbl. water, Lansing 3,032-61 ft., 5-in. 3,305½ ft., T.D. 3,306½ ft.

Laton, Rooks County: Doley Oil 1 Lucht, E½ SE NE 9-9-16w, dry, T.D. 3,276 ft., Lansing 3,152 ft.

Lost Springs, Marion County: Veeder Supply et al 1-A Jones, N½ SE NW 28-17-4e, pumped 437 bbl., Mississippi 2,344-2,456 ft. and 2,370-95 ft., 5½-in. 2,335 ft., T.D. 2,400 ft.

McLouth, Jefferson County: McLaughlin 1 Knutson, SW SW NW 33-9-20e, gaged 6,000,000 cu. ft. gas, Bartlesville 1,399 ft., 6-in. 1,395 ft., T.D. 1,426 ft.

E. V. Jackson 1 Bessie McLeod, NW SE 5-10-20e. gaged 7,700,000 cu. ft. gas, Bartlesville 1,483 ft., 5-in. 1,481 ft., T.D. 1,501 ft.

Pawnee Rock, Pawnee County: Kessler & Hall 4 Belt-A, W½ NW SW 13-20-16w, dry, T.D. 3,884 ft., Arbuckle 3,783 ft.

Peace Creek, Reno County: Cities Service 1 Snowbarger, SW SW NW 22-23-10w, flowed 3,000 bbl. Viola 3,802 ft., 5-in. 3,802 ft., acid, T.D. 3,809 ft.

Ray, Phillips County: Cities Service 1 Ray-C, NE NE NE 32-5-20w, pumped 840 bbl., La Motte sand 3,569 ft., 5-in. 3,564 ft., T.D. 3,582 ft.

Severy, Greenwood County: Derby Oil et al 2-A Davis, NE SW NE 8-28-11e, pumped 6 bbl., Kansas City 1,188-94 ft., 5-in. 1,188 ft., T.D. 1,229 ft.

Silica, Rice County: Sharon Drilling 1 Dittmers, E½ NE SW 28-19-10w, pumped and flowed 333 bbl., Lansing 3,036-44 ft., 5-in. 3,230 ft., perf., acid, T.D. 3,240 ft.

West Silica, Barton County: Virginia Drilling 1 Herter-A, S½ SE NE 17-20-11w, pumped 879 bbl., Arbuckle 3,297 ft., 5-in. 3,298 ft., acid, T.D. 3,311 ft.

Stoltenberg, Ellsworth County: R. E. Derickson et al 2 Seiemsen, S½ NE NW 2-17-10w, pumped 376 bbl., Arbuckle 3,264 ft., 5-in. 3,269 ft., acid, T.D. 3,302 ft.

Cities Service 1 Schroeder-C, N½ NE NW 34-16-10w, pumped 292 bbl., Arbuckle 3,285 ft., 5-in. 3,286 ft., acid, T.D. 3,307 ft.

Trapp, Barton County: Shell 5 Hoffman-B, NE SE NW 12-16-14w, dry, T.D. 3,360 ft., Arbuckle 3,312 ft.

Virgil, Greenwood County: Henderson Oil 6 Schneider,

(Continued on Page 88)

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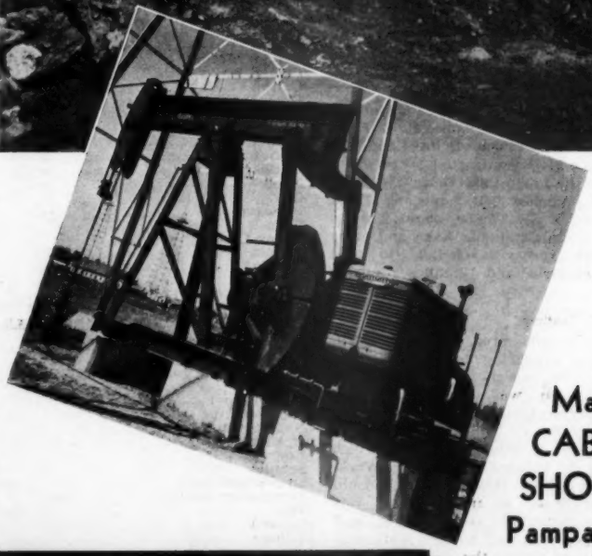

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TULSA, OKLAHOMA

Catahoula Lake District Active After Rapides Parish Show

By R. MARNE SANFORD

SHREVEPORT, La., Nov. 17.—There were three new wildcats or semiwildcats staked in the Catahoula Lake district of Central Louisiana the past week to make this area the hottest wildcatting spot in the state. Several deep Wilcox zone failures have been drilled in the district embracing the southern part of La Salle and southern Catahoula parishes, however, exploration continues unabated.

New wildcats for the week included Phillips and Carter 3-B Tensas Delta Land Co. which is a two-location west outpost to the one-well Larto Lake field. It is located in NW SE 14-5n-5e. The company's 2-B Tensas is a north offset to the discovery. About 3 miles west of the shore of Larto Lake and some 6 miles southwest of the field of that name, H. L. Hunt has staked location for 1-A Tensas Delta Land Co., located in SW NE 7-4n-5e. It is contracted to the 5,100-ft. Wilcox pay found in the Larto Lake field. The third new wildcat is N. H. Wheless 1-B Louisiana Delta Lumber Co., located in NE SE 3-5n-3e, about 2 miles south of the shore of large Catahoula Lake and some 9 miles southwest of the Cypress Bayou field, 12 miles west of the Larto Lake field, and 12 miles south of the Nebo field.

SUMMARY OF COMPLETIONS

North Louisiana

	No.	Bbl.	Footage
Oil wells: Caddo	3	200	4,724
Little Creek	1	156	2,752
Nebo	1	185	4,312
Olla	2	167	4,791
Gas wells: Monroe	1	*14.2	2,167
Trout	1	*10.0	3,172
Dry holes: Wildcats	3	.....	15,338
Caddo	2	.....	3,975
Converse	1	.....	2,270
Nebo	1	.....	5,197
Total	16	.....	48,699

Arkansas

	No.	Bbl.	Footage
Oil wells: Wildcats	1	251	7,373
Gas wells: Urbana	1	*20.0	3,260
Dry holes: Nick Springs	1	.....	3,822
Smackover	1	.....	2,560
Total	4	.....	16,955

*Million cu. ft.

Rapides Discovery Still Testing

In the south Catahoula Lake area, Rapides Parish, M. H. Marr et al were preparing to retest 1 Eota Realty Co., SW NE 14-4n-3e, but the prospect of opening commercial production was not encouraging. After cementing off perforations at 5,786-90 ft., the hole was drilled out to 5,800 ft., and on a production test the well flowed 20 bbl. of fluid per hour, of which 88 per cent was oil and the balance wash water. Working pressure built up to 550 lb. Before the well could clean itself, salt water broke in and the well was killed. Casing was then perforated at 5,786-88 ft., and the well swabbed 100 per cent salt water. Additional geological markers released during the week show the Cockfield topped at 2,430 ft., Sparta at 3,238 ft., and the Midway at 7,014 ft. Other sands in the Wilcox were logged at intervals from 5,005-5,150 ft., and these will be tested should the well fail to produce from the lower section.

NORTH LOUISIANA COMPLETIONS

Wildcats

Catahoula Parish: O. C. Borah 1 Womack, 1,980 ft. from north and 660 ft. from east lines of SE cor. Sec. 33 but in irregular 54-9n-5e, top Wilcox 2,880 ft., Midway 5,456 ft., dry at 5,572 ft.

Natchitoches Parish: H. L. Hunt 14-F Goodpine, SW NW 36-13n-6w, dry at 5,786 ft.

Winn Parish: H. L. Hunt 11-F Goodpine, SE NW 35-10n-3w, dry at 3,980 ft.

Fields

Caddo, Caddo Parish: J. W. Bailey 7 Muslow, NW SE SW 31-21n-15w, 35 bbl., 1,570 ft.

Davis & Hart 6-A Muslow, SW NE 5-20n-15w, 90 bbl., 1,502 ft.

H. E. and T. L. Philip 1 Hardy, NW SE NE 29-21n-15w, dry at 1,528 ft.

Stanolind 3 Lane, SW NE 13-21n-15w, 75 bbl. oil and 150 bbl. water, 1,653 ft.

Valley Osage Oil 1 Robertson, SE NW 33-22n-15w, dry at 2,447 ft.

Converse, Sabine Parish: A. R. Chestnut 1 Thames, NE SW 4-8n-13w, dry at 2,270 ft.

Little Creek, La Salle Parish: Placid Oil 14-A Tremont, SE SE 24-9n-1e, 156 bbl. oil and 15 bbl. water, perf. casing 2,456-64 ft., T.D. 2,752 ft.

Monroe, Ouachita Parish: Hope Prod. 1 Pace Lake Gas Co., NW SE 11-19n-3e, 14,240,000 cu. ft. gas, 2,167 ft., T.D.

Nebo, La Salle Parish: H. L. Hunt 68-F Goodpine, SE NE 10-7n-3e, 185 bbl., perf. casing 4,014-18 ft., 4,312 ft., T.D.

H. L. Hunt 121-F Goodpine, irregular 37-7n-3e, dry at 5,197 ft.

Olla, La Salle Parish: Placid Oil 115 Louisiana Central, SW NW 35-10n-2e, 146 bbl. oil and 30 bbl. water, perf. casing 2,096-2,102 ft., 2,401 ft., T.D.

Placid Oil 116 Louisiana Central, NE SE 23-10n-2e, 21 bbl. oil and 5 bbl. water, perf. casing 2,335-44 ft., 2,390 ft., T.D.

Trout, La Salle Parish: Big West Drlg. Co. 1 Whatley, SE NW NE NE 25-8n-2e, 10,000,000 cu. ft. gas, 3,168-72 ft., T.D.

ARKANSAS

The Smackover lime has again paid off in South Arkansas to furnish that district with a new oil boom. Not that activity was lacking over the past months, but most attention was turned toward the development of the several gas fields and it was more than passively supposed that when new Smackover lime fields were found they, likewise, would be gas and distillate areas.

AVERAGE DAILY PRODUCTION

NORTH LOUISIANA

	Nov. 15	Nov. 8
Caddo light	6,520	6,560
Caddo heavy	2,230	2,250
Cotton Valley	17,420	16,985
Cross Lake	2,510	2,555
De Soto and Red River	1,005	995
Haynesville	2,625	2,635
Homer	2,980	2,950
Lisbon	2,550	2,775
Little Creek	2,880	2,795
Nebo	4,580	4,495
Olla	14,110	13,945
Rodessa	13,155	13,820
Sligo	2,505	2,520
Sugar Creek	1,470	1,475
Urania	2,090	2,180
Zwolle	960	975
Total North Louisiana	82,120	82,445

SOUTH ARKANSAS

Atlanta	2,800	2,700
Buckner	2,325	2,335
Champagnolle	925	960
Dorcheat	1,820	1,815
El Dorado	1,360	1,400
Magnolia	18,850	18,955
Nick Springs	685	760
McKamie	2,190	2,210
Rodessa	1,165	1,225
Schuler	16,565	16,625
Smackover light	1,825	1,670
Smackover heavy	12,635	12,300
Troy	1,310	1,230
Urbana	2,800	2,910
Village	965	940
Total South Arkansas	72,780	72,440

MISSISSIPPI

Tinsley	75,805	63,675
Pickens	455	475
Total Mississippi	76,255	64,150

The newest discovery is Atlantic Refining Co. 1 Davis unit, located in NE NW 15-17s-18w, northwest of the Schuler field and about 3 miles south of the town of Mount Holly. It was officially completed the past week for a potential not quite up to the standard that first observers estimated, but nevertheless a good discovery well. It flowed 251 bbl. daily with no water present from perforations in 5½-in. casing at 7,166-68 ft. The oil was 38.9 gravity, leaving little question as to whether it would eventually turn to distillate as a few of the 55 to 58-gravity wells have done in the area after being on production for a few weeks. The hole is bottomed at 7,373 ft., plugged back to 7,180 ft. The official gage was through 11/64-in. choke under pressures of 2,050 lb. on tubing and 2,375 lb. on casing. Geological markers encountered in the well are as follows: Base chalk 2,425 ft., Tokio 2,855 ft., red beds 3,030 ft., Glen Rose 3,100 ft., James 3,510 ft., Buckner 7,027 ft., Smackover 7,137 ft., first porosity 7,148 ft., oil porosity 7,156 ft., water 7,177 ft.

No new locations have been announced in the vicinity of the new field, but the discovery well is being heralded as one of the major strikes since the Schuler field 4 years ago and the extent of the drilling campaign will depend only on the size of the pool.

East Schuler Field to Get Rapid Play

One of the biggest developmental programs ahead for the coming months will be in the East Schuler field of Union County. Three new tests are to be drilled at once and it is expected that considerable offset drilling will follow. The Atlantic Refining Co. which recently completed a producer in the area to

(Continued on Page 88)

Southwest Texas Fields

(Continued from Page 63)

Walker, 76 bbl., ⅛-in. choke, perf. casing 5,638-41 ft., T.D. 5,643 ft.

Stratton, Nueces County: Chicago Corp. 26 Wardner, 90 bbl., 9/64-in. choke, perf. casing 6,575-80 ft., T.D. 6,644 ft.

Southern Minerals 30 Stratton, 84 bbl., ⅛-in. choke, perf. casing 6,664-80 ft., T.D. 6,690 ft.

Wade City, Jim Wells County: Henshaw 1-B Schreade, 113 bbl., 7/64-in. choke, perf. casing 4,909-13 ft., T.D. 4,934 ft.

LAREDO DISTRICT

Wildcats

Duval County: Humble 2-E Welder, dry, T.D. 2,467 ft.

Gonzales County: Randon Oil Co. 1 L. Dunning, dry, T.D. 6,200 ft.

McMullen County: E. M. Jones 1-B Ezzell, dry, T.D. 1,773 ft.

Starr County: Magnolia 1 Hinojosa, dry, T.D. 4,265 ft. Moss & Bishop 2 Ricaby, dry, T.D. 1,775 ft.

Fields

Bridwell, Duval County: Bridwell 6 Parr, 200 bbl., 7/64-in. choke, T.D. 4,342 ft.

Colorado, Jim Hogg County: Humble 41-B King, 187 bbl., 7/64-in. choke, T.D. 2,870 ft.

Hoffman, Duval County: Hickok & Reynolds 4 Ryiz, dry, T.D. 2,700 ft.

Kreis, Duval County: Bridwell 4 Escapule, 100 bbl., pumping, sand 3,217-28 ft.

Ginther, Warren & Ginther 1 Villareal, 11 bbl. pumping, sand 3,204-17 ft.

Oakville, Live Oak County: Simmons 4-C Reagan, 100 bbl., 7/64-in. choke, perf. casing 2,750-55 ft., T.D. 2,758 ft.

Rincon, Starr County: Continental 106-B Slick, 151 bbl., 7/64-in. choke., perf. casing 4,167-98 ft., T.D. 4,255 ft.

Continental 107-B Slick, 90 bbl., 7/64-in. choke, perf. casing 4,216-22 ft., T.D. 4,234 ft.

Sejita, Duval County: Trinity Gas Co. 1 Yzaguirre, 34,000,000 cu. ft. gas open tubing, perf. casing 5,228-34 ft., T.D. 5,500 ft.

Sun, Starr County: Circle Oil Co. 2 Olivarez, 2 bbl., ⅛-in. choke, perf. casing 4,503-09 ft., T.D. 4,602 ft.

South White Creek, Live Oak County: Simmons Oil Co. 4-C Reagan, 200 bbl., ¼-in. choke, perf. casing 1,812-17 ft., T.D. 1,821 ft.

Sweden, Duval County: Hiawatha Oil & Gas Co. 6 Herberger, 128 bbl., 7/64-in. choke, T.D. 4,940 ft.

Killam, Webb County: O. W. Killam 20 Garcia, 86 bbl., pumping, perf. casing 2,009-13 ft., T.D. 2,042 ft.

SOUTH CENTRAL TEXAS DISTRICT

Fields

Gas Ridge, Bexar County: Southwest Drilling Co. 36 Dovell, 3 bbl., pumping, top sand 405 ft., T.D. 462 ft.

SOUTHWEST TEXAS DRILLING REPORT

Brooks County: Allen & Morris 3 Hocker, dry, T.D. 2,617 ft.

Duval County: Humble 3-E Welder, E. N. Gray Sur., drilling sandy shale 2,653 ft.

Hidalgo County: W. R. Davis 1 Jackson, Jose Felix Hinojosa grant, drilling shale 3,825 ft.

La Gloria Corp. 1 Adams, La Blanca grant, S.D. 7,478 ft.

Jim Hogg County: Sun 1 Jones, Agua Nueva De Abajo grant, coring shale 4,151 ft.

Karnes County: Phillips 1 V. D. Strunk, 3½ mi. SE of Kenedy, drilling shale 2,830 ft.

Maverick County: Wellington Oil Co. 2 Chittim ranch, I.&G.N. Sur., Blk. 7, Sec. 129, preparing to make drill-stem test in Glenrose lime at 5,535-39 ft.

Wellington Oil Co. 2 Indio Cattle Co., Antonio Rivas Sur., drilling Georgetown lime 5,685 ft.

Nueces County: Premont 1 L. M. Noakes, G. Farias grant, coring shale 5,800 ft.

San Patricio County: Argo Oil Corp. 1 Wright, Juan Delgado Sur., drilling shale 3,275 ft.

Starr County: F. A. Gillespie 2 Guerra, H.&G.N.R.R. Sur. 23, T.D. 1,689 ft., prepare to abandon.

Webb County: O. W. Killam 2 Puig, Alberca de Arriba grant, dry, T.D. 2,637 ft.

Magnolia 2 Santo Tomas, Santo Tomas grant, drilling shale 3,305 ft.

Willacy County: Clark & Cowden Drilling 2 Yturria, La Sal Vieja area, drilling shale 7,245 ft.

Lincoln and Creek Counties Gain in Exploratory Work

By ROBERT INGRAM

EXPLORATION in northeastern Oklahoma, particularly in Lincoln and Creek counties, was picking up last week. A number of important wildcats were getting under way in western Creek County as a result of detailed geophysical work carried on for the past 2 years.

Most likely test was the Deep Rock Oil Co. 1 Meadors, SE NW NE 16-15-7, northeast of Stroud, which had a hole full of oil from the dolomite and Wilcox sand at a total depth of 3,984 ft. It carried 750 ft. of oil from the dolomite and had an increase from the Wilcox topped at 3,976 ft. (see drilling report). Deep Rock and the Nabob Oil Co. hold most of the acreage around the well, with Mid-Continent Petroleum Co. having the SW 16-15-7 and the Texas Co. the W½ SW 9-15-7.

Other tests under way or starting apparently were part of a campaign to open local highs which might be somewhat similar to the drilling in Okfuskee County during the past 2 years. Anderson-Prichard let the contract and was ready to start a Wilcox sand test in NE NE SW 18-15-7, north of Stroud and west of the Meadors well, on a 200-acre lease farmout from the Shell Oil Co., Inc. Shell was also about ready to start at 1 Bishop, NE NE SW 12-15-8, southwest of Bristow. Youngblood & Foree of Oklahoma City started a test and Central Commercial Oil Co. was drilling (see below).

Meantime the extension area at Depew in Creek County continued making new wells. Stanolind-Amerada completed 3 Starr, NW NW NE 18-15-8, for 102 bbl. a day from the Wilcox and Fidelity Royalty, Ross Oil Co. et al 2 E. Starr, NE SE SW 7-15-8, was being put on the pump after it swabbed 95 bbl. a day from sand shot at 3,790-3,880 ft.

Dutcher Strike May Start Deepening Campaign

Some quarters expected a genuine revival of the old Bartlesville sand area in Creek County as a result of the showing at D. W. Franchot & Co. and Mid-Continent 3 Farris, SE SE 36-17-8.

The hole was drilled to 3,093 ft. in the Dutcher and a liner was set at 3,089 ft., preliminary to testing a hole full of oil. Ten to 12 years ago the area was the scene of an intensive development program in the Bartlesville, and it was expected that many of these old wells will be deepened to the Dutcher.

Lincoln County Gets New Tests; Northwest Davenport Defined

In Lincoln County, meantime, where Skelly Oil Co. has led a wildcatting drive, Basil Wagner, geologist of Chandler, filed leases on a 240-acre block in E½ 17-14-4, and announced tentative location for a well in NE NE SE 17-14-4, near Chandler. Earlier in the week Mr. Wagner paid $832 for leases on W½ NW and W½ SW 16-14-4, at the state School Land Commission sale. Associated with Mr. Wagner are W. K. Jones and R. D. Jones of Oklahoma City. In 1937 these operators drilled 1 School Land, NE NE SE 16-14-4, to get 30 bbl. a day from the Wilcox. Production declined to where the well was noncommercial, but geophysical studies later were said to have indicated a structure south and west of the old well.

In the same general area, F. T. Haddock and K. V. Moore still were fishing for tools at 1 Hert, NW NE SE 22-17-3. The well blew out when plug was drilled in the Wilcox sand at 4,536-55 ft. and drilling line was kinked and tools dropped in the hole. Skelly spudded at 1 Stewart, NE NW NW 2-13-2, on a geophysical block, and Llano Oil Co. 1 Richie, NW NE NE 32-15-5, flowed into pits from Prue sand at 3,535-49 ft. The new Northwest Davenport area apparently was defined at Blackwell Oil & Gas 1 Dollison, NW NW NW 33-15-5, which had a hole full of water from the Prue zone at 3,505-50 ft.

Apache, Rusk and Cumberland Pools Being Extended

Okfuskee County's new Rusk pool had its seventh producer at D. B. Mallernee 1 Robertson, NW NE SE 7-11-8, testing saturated Cromwell sand at 3,680-88 ft. . . . Gulf Oil Corp. staked location for 1 Church, SE SE 3-5-12w, on the west side of the Apache field of Caddo County. It brought active operations at Apache to 12—nine being drilled by Texas Co. and one each by Amerada and Sinclair Prairie. . . . Pure Oil Co. staked location for 2 Park College-200, NW SW SE 27-5s-7e, in an attempt to extend the field to the east in the newly opened McLish sand. It is near the first Park College well which was a dry hole in the Bromide sands. . . . A Cromwell sand test at West Fitts is expected to be started soon by C. W. Roodhouse and Phillips Petroleum Co. in N½ SW NE 28-2-6, as a result of a Corporation Commission order amending present spacing regulations.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	22	2,840	72,393
Wildcats	1	55	2,772
Gas wells: Fields	6	*35.4	16,391
Dry holes: Fields	7	.....	15,583
Wildcats	2	.....	5,214
Total	38	....	112,380
Recompletions	6	934	.....

*Million cu. ft.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	Nov. 15	Nov. 8
Allen	4,100	4,125
Billings	6,325	6,350
Burbank	8,400	8,450
South Burbank	7,725	7,775
Balance Osage	18,225	18,275
Blackwell district	3,300	3,350
Bristow-Slick	6,300	6,450
Cement	13,900	14,500
Coyle	4,100	4,150
Crescent	1,425	1,400
East Cromwell	4,450	4,475
Cromwell	2,850	2,875
Cumberland	9,350	.
Cushing-Shamrock	8,750	8,800
Dill	2,450	2,425
Duncan	3,350	3,300
Edmond	3,325	3,300
Fish	4,000	4,025
Fitts	10,250	10,600
Jesse	1,975	1,950
Graham-Fox	2,075	2,050
Guthrie	3,250	3,300
Healdton	8,300	8,350
Hewitt	14,250	14,000
Keokuk	2,925	2,950
Konawa	1,050	1,025
Lucien	5,600	5,650
Moore	850	875
Northeastern counties	17,250	17,100
Oklahoma City	81,250	82,900
Olympic	1,650	1,625
Ramsey	4,650	4,700
Sasakwa	1,125	1,125
Sholem-Alechem	2,450	2,500
Stroud, East	1,850	1,875
Seminole district:		
Bowlegs	5,650	5,625
Carr City	2,125	2,100
Dora	1,250	1,275
Earlsboro	3,475	3,500
East Earlsboro	1,550	1,525
South Earlsboro	550	575
Little River	6,175	6,150
East Little River	600	575
Mission	1,200	1,175
Seminole	6,050	6,025
East Seminole	850	825
Searight	1,825	1,850
Total Seminole	31,300	31,200
St. Louis-Pearson	17,100	17,150
Tatums-Tussy	5,025	5,050
Wewoka	1,525	1,500
Yale-Jennings	3,325	3,350
Total Oklahoma	427,650	421,750

OKLAHOMA COMPLETIONS

Wildcats

Bryan County: Sinclair 1 Irwin, SW SE SE 18-6s-12e, dry, T.D. 2,033 ft., Oil Creek 1,528 ft.

Creek County: Zephyr Drilling 1 Bishop-B, NW NW SE 34-17-8, pumped 55 bbl., 38-gravity, Red Fork 2,713-25 ft., sandy shale 2,757-72 ft., 5-in. 2,714 ft., shot 2,717-37 ft., T.D. 2,772 ft., *opens new sand in new pool.*

Major Oil 1 Estate Land Co., SE SE NW 2-17-9, dry, T.D. 3,181 ft., Wilcox 3,150 ft.

Okfuskee County: Kelly 1 Whitney, NE NW NE 3-13-7, location abandoned.

Pontotoc County: V. H. Burns 1 Bogan, SE SE NE 29-4-5, spud and abandoned.

Seminole County: Lynch 1 Kinney, NE NW 25-5-5, location abandoned.

(Continued on next page)

State Capitol Area of Oklahoma City Sees Renewal of Activity

Sunray Oil et al celebrated Armistice Day this year by starting initial test on 11 State, at northwest corner of the capitol. The well pumped 475 bbl. of oil which was capacity of the beam pump.

The well was completed several years ago as a directional hole under the capitol grounds, which proved to be not leased. When litigation started about 5 months ago Sunray plugged back and redrilled the hole to present depth of 6,504 ft.

At direction of Governor Phillips the Sunray Oil Co. and Phillips Petroleum Co., owners of 11 State lease, were sued for $520,000 as difference between the royalty already paid and total value of the oil recovered through the whipstocked well. Several weeks ago, the companies settled the litigation by payment of $120,000.

Sunray was drilling on two other wells, southwest of the capitol: No. 3 Jones-Harn, SE NW NW of 27-12-3w, was drilling Wilcox sand at 6,527 ft., and No. 4 was bailing mud to drill plug, with pipe set at 6,465 ft., total depth 6,475 ft.

Lincoln Terrace Well Is Starting

The city council has authorized companies to cross under city streets in order to drill a directional well from the Historical Society grounds under Lincoln Terrace, and work is to start immediately.

The well will be drilled by Phillips Petroleum, British American and Sunray Oil, who recently acquired a surface lease on the state property, with provisions for the whipstocking. No number or name has yet been given the new well, which will be directed in a southeasterly direction.

Kent Shartel, attorney representing the companies, told the council his clients had leases on approximately 65 per cent of the property in Lincoln Terrace, a residential district. Drilling within the Terrace proper has been prohibited by play restrictions, which have been upheld by the state Supreme Court.

Work has been started at Phillips et al 1 State Capitol, located in the sunken garden on Lincoln Boulevard parkway, directly in front of the capitol. This well will be whipstocked under the state building to the north.

Leases on the parkway tract and the Historical Society tracts were issued early last month by the state Board of Affairs, after the recent legislature had set up the authority for whipstocking wells.

Behavior of Wells Will Present Important Evidence as to Future of Field

The Lincoln Terrace area is the only section of the field underlain by Wilcox sand which has not been drilled. It is bounded on the north by the Mansion area which was the first section to be drilled north of the capitol. On the west are state leases and the Harn tract and on the south is the State Hospital area. For several years the zoning ordinances prevented drilling in this area and there was considerable doubt as to whether recoveries would be great enough to warrant drilling when the area was thrown open for development.

Production records have shown that lateral migration of oil was very small. The principal direction of migration has been down-structure during the period when gas was being liberated from the oil by reason of reduced pressures. This resulted in shrinkage of the volume of fluid in the reservoir and a consequent lowering of the gas-oil contact. Present depths of the first oil in the Wilcox are at the level which might have been expected due to shrinkage indicating that there was either practically no drainage of oil toward the early wells or that this drainage was almost exactly offset by water encroachment. The fact that wells drilled downstructure find little evidence of water encroachment suggests strongly that there has been practically no drainage.

As the upper limits of the Wilcox zone pass through the eastern section of Lincoln Terrace, it may be expected that a few wells drilled along the western border will pick up most of the recoverable oil from this sector. Production records of wells along the Parkway and in the Harn tract suggest that they have already recovered a part of this oil. The behavior of these wells following the completion of the new wells under the Terrace together with the record of the new wells themselves will be watched with interest as they will have a decided bearing on the problem of recovering the oil still remaining in the field. Present indications are that the wells lowest on the structure will have the longest life and the largest future production which is contrary to experience in most fields.

Fields

North Bebee, Pottawatomie County: Champlin 1 Whitney, SW SW NW 10-5-5, pumped 213 bbl. oil and 38 bbl. water, Hunton 2,451-2,677 ft., 7-in. 2,451 ft., acid, T.D. 2,691 ft.

South Castle, Okfuskee County: Shell 1 Harjo-B, SW NE NW 17-11-9, 33 bbl., Hunton 3,860-3,928 ft., T.D. 3,967 ft.

Cement, Caddo County: Ohio 12 Wade, NE SW SE 2-5-9w, flowed 75 bbl., 5½-in. 6,038 ft., perf. 5,900-18 ft., T.D. 6,052 ft.

Ohio 13 Wagner-2, NW NW SW 12-5-9w, gaged 23,000,000 cu. ft. gas, 5½-in. 5,965 ft., perf. 5,010-50 ft. and 4,650-4,700 ft., T.D. 5,980 ft.

East Cromwell, Okfuskee County: Shell 1 Brewer, SE SW NW 1-10-8, dry, T.D. 4,053 ft.

Shell 2 Lehmer-A, SE NE SW 26-11-8, 91 bbl., Cromwell 3,432-43 ft., T.D. 3,443 ft.

Shell 4 Hicks, SW SW NE 35-11-8, 496 bbl., Cromwell 3,406-16 ft., T.D. 3,416 ft.

Cumberland, Marshall County: Pure 2 Thomas-203, NE NW NE 28-5s-7e, flowed 102 bbl. in 4 hr., bromide 4,735 ft., first sand 4,959 ft., 7-in. 4,953 ft., T.D. 5,029 ft.

Empire, Stephens County: Mudge Oil 14 Broadbent, SE NW NW 1-2s-5w, pumped 5 bbl., sand 672 ft., 6-in. 672 ft., shot, T.D. 719 ft.

Magnolia 32 Dillard, SW NE NE 2-2s-5w, dry, T.D. 864 ft.

West Davenport, Lincoln County: Leader Oil 2 Ritchie, SE NE NE 32-15-5, flowed 26 bbl. in 16 hr., Prue 3,533 ft., pay 3,557-68 ft., 7-in. 3,548 ft., shot, T.D. 3,568 ft.

Depew, Creek County: Stanolind-Amerada 3 Starr, NE NE NW 18-15-8, flowed 102 bbl. oil and 2 bbl. water, lower Wilcox 3,804 ft., 5-in. 3,777 ft., shot, T.D. 3,831 ft.

Guthrie, Logan County: Sunray 7 Donoghue, NW SE SE 7-17-1w, flowed 331 bbl. in 17 hr., second Wilcox 5,418 ft., 7-in. 5,419 ft., T.D. 5,427 ft.

West Hewitt, Carter County: Smith 5 Ward, S½ SE SE 18-4s-2w, old well, old T.D. 2,166 ft., sand 2,172-75 ft. and 2,230-2,310 ft., 740 bbl. oil, T.D. 2,310 ft.

Gibson & Jennings 4 Hoover, NE SW SE 20-4s-2w, 90 bbl., pay 2,965-95 ft., T.D. 3,300 ft.

Hotulke, Pottawatomie County: Wood Oil 1 Webber, NW NW NW 26-9-4, flowed 322 bbl., Hunton 4,150-70 ft., 7-in. 4,515 ft., perf., acid, T.D. 4,541 ft., *discovery of new zone.*

Keokuk, Seminole County: Carter 1 Aldridge, S½ SW NE 35-11-6, old well, old T.D. 4,111 ft., T.D. 4,125 ft., 34 bbl.

Okemah district, Okfuskee County: Grimes 3 Dodson, NE SE 35-11-9, pumped 15 bbl., Calvin 1,219 ft., shot 1,496-1,529 ft., T.D. 1,535 ft.

Sholem-Alechem, Stephens County: Amerada 9 Hanson, C SW 12-1s-4w, pumped 13 bbl., 5-in. 3,750 ft., perf. 3,160-3,280 ft. and 3,410-35 ft.

St. Louis, Pottawatomie County: Magnolia 4 Hughbanks, NE NE NW 17-7-4, pumped 273 bbl. oil, 4 per cent water, pay 3,982 ft. in dolomite and dense, 7-in. 3,982 ft., acid, T.D. 3,995 ft.

Reda Pump 2 Rice, NE SE NE 32-7-4, old well, old T.D. 4,297 ft., Wilcox 4,331 ft., T.D. 4,341 ft., pumped 32 bbl. oil and 1,650 bbl. water.

Magnolia 1-A Toll-Fyke-G, NW NE NE 29-7-5, old well, old T.D. 2,868 ft., dolomite 4,140 ft., acid, T.D. 4,170 ft., pumped 76 bbl. oil.

North St. Louis, Pottawatomie County: Amerada 3 Peters-A, NE SE NW 26-8-4, flowed 584 bbl., Hunton 3,874 ft., pay 3,877 ft., 5-in. 3,877 ft., acid, T.D. 3,918 ft.

Tecumseh Lake, Pottawatomie County: Magnolia 2 Heller-35, NE SE SE 35-10-3, dry, T.D. 5,256 ft., Wilcox 5,244 ft.

Tussy, Carter County: Phillips 1 McCrory, NE NW SE 5-1s-3w, old well, old T.D. 2,912 ft., T.D. 2,994 ft., pumped 46 bbl.

Velma, Stephens County: Magnolia 12 Quackenbush, NW SW 8-2s-4w, gaged 900,000 cu. ft. gas, 100 lb. R.P., sand 637-41 ft., 7-in. 637 ft., T.D. 641 ft.

Weleetka, Okfuskee County: Doak & Hughes 3 Pinchem, NW NE SE 16-10-11, pumped 32 bbl., Cromwell 2,864 ft., 8-in. 2,773 ft., T.D. 2,870 ft.

South Wetumka, Hughes County: T. J. Lynch 2 Canard, NE SW NE 27-9-10, gaged 3,750,000 cu. ft. gas, 750 lb. R.P., sand 2,311 ft., 5-in. 2,311 ft., T.D. 2,320 ft.

Miscellaneous

Creek County: Bryan Petroleum 1 Sootkey, NW SE SW 26-14-7, 3,000,000 cu. ft. gas, Bartlesville 3,130-46 ft., 5-in. 3,119 ft., T.D. 3,160 ft.

B. F. Green 2 Myers, SE SE SE 1-17-9, pumped 12 bbl., Oswego 1,678-1,733 ft., 6-in. 1,370 ft., T.D. 1,736 ft.

Sinclair 43 Dacon, SE SE NE 16-17-7, pumped 3½ bbl. oil and 1 bbl. water, Oswego 2,158-2,229 ft., Bartlesville 2,677-2,721 ft., 5-in. 2,612 ft., T.D. 2,723 ft.

Sinclair Prairie 5 Gooden, SW NW SE 16-17-7, pumped 6 bbl. oil and 80 bbl. water, old T.D. 2,774 ft., T.D. 2,794 ft.

J. F. Upton 2-A fee, NE SE NE 4-16-12, dry, T.D. 2,293 ft., Wilcox 2,288 ft.

Okmulgee County: Vierson 10 Storm, S½ NE NW 16-13-12, dry, T.D. 2,180 ft., Bartlesville 2,152 ft.

M. E. Craig 1-B Chain, NE NW NW 21-13-14, pumped 1 bbl., sand 1,635 ft., 6-in. 1,622 ft., T.D. 1,642 ft.

Pawnee County: Johnson 3 Taylor, SW SE 10-20-7, flowed 18 bbl., Mississippi lime 2,808 ft., 5-in. 2,801 ft., shot 2,811-37 ft., T.D. 2,839 ft.

Payne County: Comail 2 Meyer, SE SE SE 17-17-6, 2,740,000 cu. ft. gas, Prue 2,825 ft., 5-in. 2,826 ft., T.D. 2,888 ft.

Tulsa County: W. B. North and J. W. Shreve 2 Newblock, NE SE 4-18-14, gaged 2,000,000 cu ft. gas, 398 lb. R.P., Dutcher 1,373 ft., 6-in. 1,210 ft., T.D. 1,402 ft.

Midco Oil 1-A Tiblow, SE NW NW 9-21-13, 3 bbl., pay 1,285-1,301 ft., T.D. 1,301 ft.

Wagoner County: Bert Mullins 1 Williams, NE NE NE 29-18-17, dry, T.D. 540 ft.

French Brothers 5 Mobbs, SW NW SE 20-18-17, dry, T.D. 425 ft., Tyner 385-95 ft.

Elmer Rule 1 Aetna Life, N½ NE NE 34-18-17, old well, old T.D. 286 ft., Tyner 700-20 ft., T.D. 720 ft., gaged 400,000 cu. ft. gas.

Input Wells

Glenn Pool, Creek County: Sinclair Prairie 29 Berry hill, SE SW NW 16-17-12, Glenn sand 1,408-1,578 ft.

Gulf 25 Randolph, SE SW SW 16-17-12, Glenn sand 1,390-1,550 ft., 4-in. 1,448 ft., T.D. 1,555 ft.

OKLAHOMA DRILLING REPORT

Panhandle

Cimarron County: Gulf 1 Cox, SE SE 35-2n-8ecm, moving in.

Texas County: Peerless Oil & Gas 1 Hopkins, W½ NW NE 7-4n-18ecm, acidized with 5,000 gal., tight hole, expected to complete for gas well.

South and Southwest

Atoka County: C. A. Matson et al 2 Rowland, SW NE NE 18-3s-10e, drilling 842 ft., lime and shale.

Caddo County: Amerada 1 Sprages, SE NW 11-8-12w, Wellington 2,725 ft., anhydrite 3,585-70 ft., Panhandle lime 3,985-4,249 ft., Pontotoc 5,295 ft., coal 7,774-77 ft., drilling 8,170 ft. in shale and shells.

Denver Producing 1 Sah-Cam, SE SE 33-10-10w, drilling 11,328 ft.

Coal County: Magnolia 1 Pope, SE SE NE 34-1-9, underreaming 10-in. 760 ft.

Comanche County: Texas 1 Gamble, SW NE SE 5-3-10w, drilling 5,462 ft. in Woodford.

Texas 1 State land, SW SE NW 13-3-10w, drilling 6,988 ft. in sand and shale, Pontotoc 6,700 ft.

Texas 1 School Land-B, SW SW 13-4-11w, Sycamore 4,264 ft., drilling 4,380 ft.

Denver Producing 1 Hayes, NE NE SW 14-4-11w, base bromide sand 2,530 ft., drilling 2,687 ft.

Grady County: Ray Stephens 1-A Johnston, NW NE NW 18-5-8w, Wade sand 4,350 ft., cored stained sand with odor 4,366-78 ft., cored sand and shale 4,381-91 ft., cored stained sand 4,394-4,404 ft., D.S. test 4,343 ft., recovered salt water, S.D. 4,556 ft.

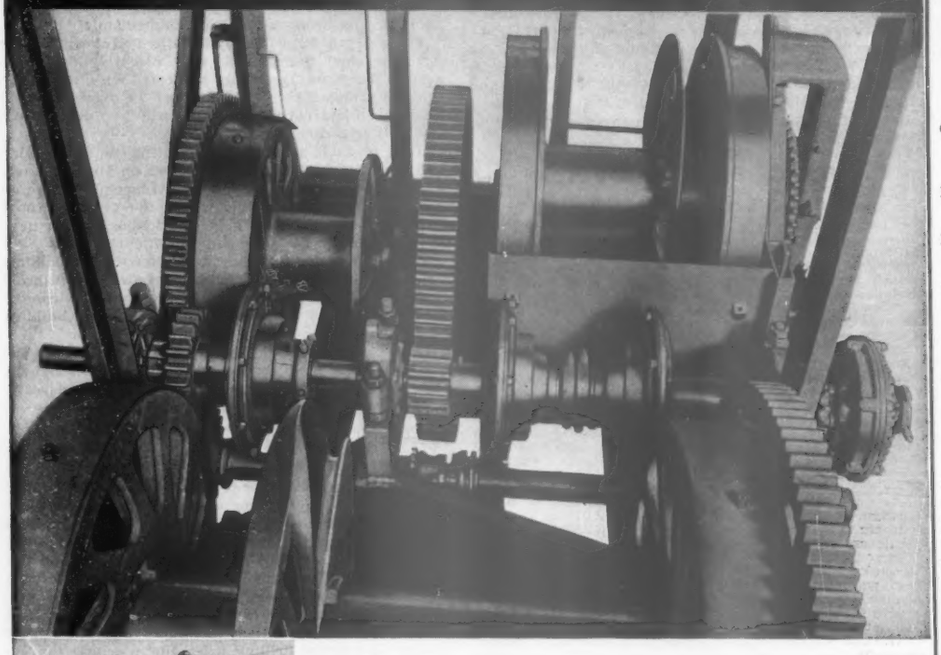
Kiowa County: E. M. Thomason 1 Baker, NW NE NW 7-6-18w, rainbow oil 740 ft., drilling 750 ft., sand.

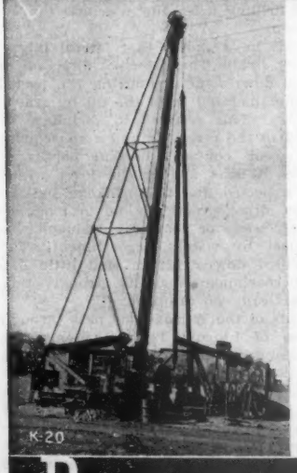
J. G. Hughes 1 Dugger, NE SW SW 14-6-18w, 7½-in. 1,965 ft.

Stauffer Petroleum 1 Mayo, NE NE NW 13-6-18w, drilling 1,035 ft.

(Continued on Page 88)

TWO speeds forward and INSTANTANEOUS REVERSE





Two speeds forward and **instantaneous** reverse is one of the sweetest tricks Bucyrus-Erie has built into their new 36-L spudder. Plus the big equalized twin brakes on bull and sand reels, it means speed and control on the lines that saves a lot of time on any type of drilling or servicing. For instance, you can pull 4,200 pounds of tools from 3,000 feet in 8 minutes in high, or throw into low and get a pull of 14 to 15 tons to haul out of trouble. With the sand reel in high, you can take a 7x30" bailer 3,000 feet in 3 minutes. And the calf reel gives you to 47 tons of pull with 6-part tackle.

Here's a machine that is writing spudder history. Get in on it. Let it write its story of modern speed and profit on your books.

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SOUTH MILWAUKEE, WISCONSIN

New Zone at North Belridge Passed Up By Early Wells

By L. P. STOCKMAN

LOS ANGELES, Calif., Nov. 17.—Belridge Oil Co. proved up the existence of a new highly productive zone in the North Belridge field of Kern County last week and it is quite probable that operators will take appropriate steps to further develop the zone in the immediate future. The new productive horizon is located between the Wagonwheel zone of Eocene age and the Temblor zone of Miocene age. It was logged in a number of wells during the early stages of development but it was not thought of sufficient importance to justify the landing of a string of casing.

Belridge Oil Co., however, brought in 24-27 in 27-27s-20e flowing 2,000 bbl. of 50.1-gravity oil and 9,000,000 cu. ft. of gas daily from a zone that approximates 150 ft. in thickness. The well is bottomed at 8,240 ft. and the 9-in. casing that was cemented at 8,240 ft. was perforated at 7,890-7,930 ft. It is from the latter interval that present production is coming. Prior to completion in the new zone the company perforated the 9-in. at 7,630-90 ft. but subsequently squeezed cement through the perforations and closed this interval to the well.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: San Joaquin Valley	7	5,286	53,859
Coastal district	7	3,223	36,163
Los Angeles Basin	11	5,044	46,807
Gas wells: Rio Vista	1	.....	3,992
Dry holes: Fields	3	.....	10,303
Wildcats	6	.....	34,491
Total	35	13,553	185,615

Commercial production from this zone opens up a number of new locations for development and it is not at all improbable that several Temblor wells may be deepened to this new horizon. This is of special interest in view of the present status of the Temblor which is badly depleted and is now being repressured with gas from the Wagonwheel. Approximately 10,000,000 cu. ft. of Wagonwheel gas is going into the Temblor and this quantity will be substantially increased in the near future.

In addition to stepping up the amount of gas injected into the Temblor and reducing production of gas from the Wagonwheel zone, operators have shut in all high gas-oil ratio wells producing from the Wagonwheel horizon. It was indicated several weeks ago that the new zone found between the Temblor and Wagonwheel zones would be found productive when drilled but there was nothing to show that the zone would prove as prolific as revealed by the production test of Belridge 24-27, located on fee-owned acreage.

The first indication that the new zone would prove productive was noted when one of Tide Water Associated's wells producing from the Wagonwheel zone through 2½-in. tubing began making oil through the annular space between the tubing and casing. It was decided that this oil must be coming from a new zone not cased off, but it remained for Belridge Oil Co. to make the discovery. Union Oil Co. cored this new zone several years ago in 7 Gibson in 36-27s-20e but had difficulty in segregating it and finally completed the well in the Wagonwheel zone.

Electric logs made during development of the Wagonwheel zone showed the new zone to be located from 400 to 450 ft. above the top of the Wagonwheel zone and having a thickness of 150 ft. The sand was cored in several wells and was described as hard, fine to medium grained gray sandstone having a good gasoline odor and an occasional amber cut. Electric logs show this sand to be equal in porosity and resistivity to that of the Belridge, Bloemer and Wagonwheel zones which indicates the possibility that it may prove to be exceptionally productive. It remains to be seen whether it will conform in areal extent to the present productive limits of the field or be restricted to the northern section of the field as some have believed.

The deep test which Belridge Oil Co. is drilling in the North Belridge field has reached a depth of 10,800 ft. and the crews are now plugging back and testing by stages. This well is over 2,500 ft. below the Wagonwheel zone and while some minor showings have been located below the bottom of the Wagonwheel it remains to be seen whether they will be found productive. This deep test is 55-26 fee in 26-27s-20e and appears to preclude the development of large production below present known zones and tends to eliminate the Cretaceous as far as crude-oil production at North Belridge is concerned.

AVERAGE DAILY PRODUCTION

	Nov. 15	Nov. 8
Wilmington	88,740	89,765
Midway-Sunset	50,475	46,305
Coalinga	49,525	41,290
Ventura Avenue	38,725	36,865
Long Beach	38,575	38,570
Kettleman North Dome	38,375	36,835
Huntington Beach	28,900	27,825
Santa Fe Springs	23,450	22,080
Dominguez	22,710	23,100
Santa Maria Valley	21,850	20,350

Eastern Paloma Test Logs

Rare Grahamite Horizon

It looked for several days like Western Gulf Oil Co. and Texas Co. had found a normal black zone in 12-7 Symons, a joint undertaking in the extreme eastern end of the Paloma distillate field in Kern County but the operators now believe this original opinion to be erroneous. The sand found is extremely deceiving but has been identified as Grahamite which is a rare occurrence in California oil fields. Grahamite is a lustrous, pitch black mineral resembling asphaltum and was originally identified and named after J. A. and J. L. Graham owners of a mine where it was first obtained.

This joint outpost of Western Gulf and Texas Co. is down slightly below 11,600 ft. and already has enough oil sand higher up in the hole to justify the expectation of developing production in the Paloma zone which contains the hydrocarbons in the vapor phase. This eastern outpost will extend the productive limits of the field when completed as it is about 1 mile east of the nearest production. The bit is going ahead below the Paloma distillate zone in order to determine the status of the column underlying the Paloma zone and also to ascertain if there is a normal black crude-oil zone present below the Paloma zone.

A unit plan of development has been formulated for the Paloma field and experimental work is under way to accumulate necessary engineering data upon which to predicate construction of a repressuring and absorption plant to recover the distillate and reinject the gas back into the zone. This unit plan includes Western Gulf, Texas Co. and Ohio Oil Co. and involves a total of 1,600 acres although plans contemplate the inclusion of other adjacent acreage upon completion of a producing well.

Raisin City West Outpost

Has Been Abandoned

Bandini Petroleum Co., subsidiary of Wilshire Oil Co., independent producer, refiner and marketer, found the Miocene and Eocene barren in its Raisin City wildcat, 82-23 Southern Pacific in 23-15s-17e, and has accordingly abandoned the hole. The wildcat was located about 1 mile west of Shell's discovery well in the Raisin City field and was found to be definitely off the structure. Its abandonment has been expected for several weeks. Top of the Eocene was cored at 6,418 ft. and the hole was stopped at 6,546 ft. in rocks of Cretaceous age.

Seaboard Oil Corp. and Shell should each have a well ready for a production test in this field within another 10 days and both should prove commercially productive. The Raisin City field is still in a probationary state in the minds of many due to the varying degrees of success that have resulted from drilling operations to date. In the Helm district of Fresno County, Amerada 31-34 Clover in 34-16s-17e built up to 662 bbl. of clean 64.7-gravity oil daily along with 13,618,000 cu. ft. of gas through an 82/64-in. bean but has since been shut in and shows a closed-in pressure of 2,700 lb. Discovery of the Helm field has greatly stimulated leasing activities north and northeast of Helm and for this reason it is logical to assume that at least one wildcat will be put down in the area in the near future. This entire area in Fresno County has become the latest hot spot in the state.

SAN JOAQUIN VALLEY COMPLETIONS

Dyer Creek, Kern County: Shell 2 Smith-Cairns, 11-26s-27e, abandoned as unproductive commercially, T.D. 2,491 ft., P.B. 2,220 ft., top Vedder oil sand and gray sand 2,287 ft.

Greeley, Kern County: Superior 2 Lewis, 12-29s-25e, flowed 1,548 bbl., 36.3-gravity, 0.1 per cent cut, 923,000 cu. ft. gas, 32/64-in. bean, pressures 1,300/1,350 lb., T.D. 11,490 ft., 120-mesh perf. 11,417-90 ft., completed in Rio Bravo zone 11,416 ft., and Vedder zone 11,471-90 ft. of Miocene age.

Kern River, Kern County: General Pet. 2 Young, 14-28s-27e, pumped 66 bbl., 14.6-gravity, 20 per cent cut, T.D. 2,032 ft., P.B. 2,011 ft., perf. 1,800-2,010 ft., completed in Tegeler zone of Kern River series.

Kettleman North Dome, Fresno County: K.N.D.A. 343-30-J, 30-21s-17e, flowed 270 bbl., 50.4-gravity, 0.4 per cent cut, 600,000 cu. ft. gas, 18/64-in. bean, pressures 2,400/2,550 lb., T.D. 11,105 ft., perf. 10,452-11,059 ft., completed in McAdams zone of Eocene age, top brown shale 6,155 ft., Temblor 7,495 ft.

Standard 324-35-J-E fee, 35-21s-17e, flowed 226 bbl., 49.2-gravity, 0.5 per cent cut, 10,400,000 cu. ft. gas, 32/64-in. bean, pressures 2,860/3,400 lb., T.D. 10,446 ft., perf. 10,109-10,441 ft., completed in McAdams zone of Eocene age, top Temblor 6,046 ft., Bentonite 6,950 ft.

Standard 52-27-Q fee, 27-22s-18e, flowed 1,151 bbl., 38.6-gravity, 0.5 per cent cut, 2,235,000 cu. ft. gas, 52/64-in. bean, pressures 350/985 lb., T.D. 8,165 ft., perf. 6,784-6,962 ft., 7,845-7,937 ft., 7,983-8,158 ft., completed in Temblor zone of Miocene age.

Mount Poso, Kern County: Vedder Pet. Co. 7 S.P., 3-27s-28e, pumped 30 bbl., 14.8-gravity, 7 per cent cut, T.D. 1,401 ft., 140-mesh perf. 1,381-1,401 ft., completed in Vedder zone of Miocene age, top hard tight Vedder oil sand 1,387 ft., bottomed in Vedder oil sand.

Raisin City, Fresno County: Bandini Pet. Co. 88-23 S.P., 23-15s-17e, abandoned as dry hole, T.D. 6,546 ft., Kreyenhagen 6,059 ft., Domengine (Eocene) 6,418 ft., gray sand 6,449 ft., bottomed in gray sand.

Rio Vista gas field, Sacramento County: Standard 2-1 Midland fee, 3-3n-3e, flowed 16,159,000 cu. ft. gas, 43/64-in. bean, pressures 1,591/1,500 lb., T.D. 3,992 ft., perf. 285 holes 3,820-90 ft., Green sand 3,820 ft., completed in Emigh gas sand 3,625-3,992 ft. of Cretaceous age.

Rio Vista wildcat district, San Joaquin County: Standard 1 Productive Properties, Inc., 23-3n-3e, abandoned at 5,359 ft., no showings of importance logged from top to bottom.

Round Mountain, Kern County: Trico O. & G. Co. 9 Coffee, 8-28s-29e, pumped 100 bbl., 17.1-gravity, 2 per cent cut, T.D. 1,340 ft., 120-mesh perf. 1,253-1,340 ft., completed in Vedder zone of Miocene age, upper Vedder 1,250 ft., lower Vedder 1,320 ft., bottomed in lower Vedder oil sand.

Rumsey Hills wildcat district, Yolo County: Standard 1-1 Tippetts, 15-12n-3w, abandoned at 2,490 ft., flowed salt water on production test.

Tupman, Kern County: Richfield 38-27-C Kern County Land, 27-30s-25e, flowed 1,995 bbl., 34.6-gravity, 3 per cent cut, 2,260,000 cu. ft. gas, two 96/64-in. beans, pressures 250/800 lb., T.D. 9,241 ft., perf. 8,993-9,236 ft., completed in Stevens oil sand of Miocene age.

SAN JOAQUIN VALLEY OUTPOSTS

Belridge, Kern County: Belridge Oil Co. 55-26 fee, 26-27s-20e, drilling and coring 10,830 ft. in hard sand, plugging and testing by stages, top Eocene 9,545 ft., elev. 658 ft.

Buena Vista Hills, Kern County: Honolulu 25-P fee, 10-32s-24e, T.D. 14,622 ft., P.B. 3,075 ft., preparing to abandon, elev. 916 ft.

Standard 91-11-D fee, 11-32s-24e, drilling 2,710 ft. in shale, rig to pump.

Canal, Kern County: Shell 44-14-A Kern County Land, 14-30s-25e, drilling in oil sand and shale 10,950 ft., first Vedder zone test in field, elev. 325 ft.

Dyer Creek, Kern County: Shell 3 Smith-Cairns, 11-26s-27e, location.

Elk Hills, Kern County: Standard 24-19-R fee, 19-30s-23e, drilling 4,440 ft. in shale.

Standard 62-31-S fee, 31-30s-24e, drilling 6,298 ft. in sand and shale, elev. 1,220 ft.

Standard 45-19-S fee, 19-30s-24e, drilling 11,171 ft. in sand and shale, will be deep test, elev. 707 ft.

Standard 230 Tupman, 36-30s-24e, drilling 2,274 ft. in sand.

Greeley, South, Kern County: A. N. Macrate 1 Haberfeld, 32-29s-26e, drilling 11,298 ft. in sand and hard shale, top barren Stevens zone of Miocene age 8,090 ft., looking for Vedder, elev. 338 ft.

Jacalitos, Fresno County: Wilshire-Annex Oil Co. 21-26 E, 26-21s-15e, location.

Kern Front, Kern County: Richfield 1 Kraemer, 34-28s-27e, drilling 7,382 ft. in shale, top barren Eocene sand 7,200 ft.

Kettleman North Dome, Kings County: Standard 1-1-U fee, 1-23s-18e, T.D. 12,884 ft. in hard gray sand showing considerable gas, redrilled 11,640 ft., tested wet, P.B. 8,555 ft., lower part of hole abandoned, washing perfs., elev. 693 ft.

Midway-Sunset, Kern County: North Amer. Oil Consd. 1-28 W.P., 28-32s-23e, drilling 10,290 ft. in hard siltstone, elev. 1,560 ft.

Mountain View, Kern County: Hogan Pet. Co. 1-A Bahrenburg, 32-30s-29e, drilling and coring 7,181 ft. in sand and shale, will be deep test for Vedder zone.

Mount Poso, Kern County: Alpha Oil Co. 1 Elliott, 1-27s-28e, drilling in Walker sand 768 ft., elev. 1,325 ft.

Paloma, Kern County: Western Gulf 12-7 Symons, 7-

32s-27e, drilling 11,485 ft. in Pliocene sand, most easterly well in field, log shows 50 ft. of oil sand 10,850 ft., elev. 299 ft.

Raisin City, Fresno County: Barnsdall 7-24 Ripperdan, 24-15s-17e, rigging up.

Seaboard 77-13 S.T.U., 13-15s-17e, drilling in sandy shale 4,561 ft.

Shell 31-19 S.A.F.L., 19-15s-18e, drilling in sand and shale 4,284 ft.

Union Avenue, Kern County: Hancock Oil Co. 3 Roberts, 6-30s-28e, drilling 3,840 ft. in sand and shale.

SAN JOAQUIN VALLEY WILDCATS

Altamont district, Alameda County: Shell 1 Nissen, 7-2s-30, T.D. 6,000 ft., lost fish, P.B. 5,665 ft., redrilled to 5,837 ft., elev. 1,023 ft.

Belridge district, Kern County: E. A. Parkford 1 Belridge, 12-29s-21e, drilling 1,138 ft. in sand and shale, P.B. 1,103 ft., 8⅝-in. casing cemented 925 ft., elev. 563 ft.

Ciervo district, Fresno County: Texas 1 Carter, 3-17s-12w, building rig, laying water lines.

Helm district, Fresno County: General Pet. 75-33 Esperoad, 33-16s-17e, location along east line of section.

McDonald anticline district, Kern County: Texas 1 Anderson, 19-28s-20e, drilling 5,411 ft. in shale, elev. 1,080 ft.

Rio Vista district, Solano County: Standard 1 Bradford, 20-3n-3e, T.D. 4,350 ft. in gas sand, P.B. 4,226 ft., perf. 4,160-4,223 ft., testing, elev. 5 ft.

Standard 1 State, 6-3n-3e, grading and building road.

Texas Co. 1 Huth, 33-4n-3e, building road to location.

Amerada 1 Robinson, 4-4n-2e, drilling 6,751 ft. in sand.

Riverdale district, Fresno County: Amerada 45-26 Lawton, 26-17s-19e, drilling 6,191 ft. in sand.

Shafter district, Kern County: General Pet. 51-15 S.P., 15-28s-24e, drilling 12,130 ft. in hard shale and sand.

Shale Hills district, Kern County: H. C. Norton 1 Core hole, 30-26s-19e, T.D. 2,205 ft. in shale and oil sand, P.B. 1,000 ft., pumped little fluid, swabbing perfs.

Tideland Oil Co. 1 Grant, 4-27s-18e, drilling 732 ft. in sand and shale.

No Damage to Wells Reported After Latest Earthquake

Southern California experienced a second earthquake last week and while this tremor did not do any damage to producing wells, as far as can be ascertained, it did do considerable damage to property in the Wilmington-Torrance district of Los Angeles Basin. General Petroleum Corp. lost the contents of two 55,000-bbl. tanks which contained about 35,000 bbl. of crude oil and approximately 30,000 bbl. of gasoline. The earthquake occurred shortly after midnight November 13. It opened seams in the tanks permitting the contents to leak out and spread across a public highway. Fortunately no one was injured. Coincident with the breaks in the tanks, the water main went out and the 8-in. natural-gas line of Southern Counties Gas Co. went out with it.

This is the second damaging earthquake to visit southern California in about 3 weeks. The first temblor killed 13 wells in the Dominguez field by pinching or severing the casing and tubing in flowing wells. These wells are still off and it begins to look like operators, Union Oil Co. and R. E. Havenstrite, will be obliged to redrill or abandon the lower 1,500 or 2,000 ft. of the holes involved. The latter only had one derrick in the Dominguez field and since four wells were killed will either find it necessary to bring in three more or undertake the remedial work in succession.

Union Oil Co. has already started work on its wells and has erected five derricks since the earthquake last October 22. It has not been definitely determined whether any other wells in the Dominguez field have been affected but work has already been started along this line. Union Oil Co. has a number of completed wells standing shut in as a curtailment measure but since they were not flowing it is not immediately apparent whether they were damaged. Pressure bombs are being run to determine the bottom-hole pressure and thus their condition should be known within another week.

Water Intrusion at Turnbull Canyon Believed Due to Damaged Shutoff

Continental's discovery well, 1 Turnbull Community, in the Turnbull Canyon field of Los Angeles County began cutting 30 per cent water last week. While this might ordinarily be of considerable concern the company's field department is of the opinion that the water is coming in behind the shoe of the water string. This well has been worked over several times since completion and pumps have been changed and pulled several times. In addition the hole was acidized subsequent to completion in the hope of stimulating production and it is thought quite probable that the cement shutoff has been damaged. This belief is of interest because it will be recalled the company had considerable difficulty shutting off the bottom water before finally securing an effective job. Present production is 275 bbl. of oil and 125 bbl. of salty water. Previously the well has been pumping very clean oil with a little natural gas.

LOS ANGELES BASIN COMPLETIONS

Coyte West, Orange County: Severns Drilling Co. 5 McNally, 24-3s-11w, pumped 70 bbl., 24.3-gravity, 3 per cent cut, T.D. 4,190 ft., perf. 4,120-90 ft., completed in Murphy zone.

Dominguez, Los Angeles County: Shell 127 Reyes, 34-3s-13w, flowed gas lift 455 bbl., 31.1-gravity, 0.3 per cent cut, T.D. 6,270 ft., P.B. 6,160 ft., perf. 6,118-55 ft., completed in fourth Callender zone of Pliocene age.

Union 17 Carson, 32-3s-13w, abandoned as dry hole, T.D. 9,472 ft., bottomed below eighth Callender zone of Miocene age, which is deepest productive horizon in field.

Huntington Beach, Orange County: H. S. Kohlbush 8 Pacific American, 34-5s-11w, pumped 125 bbl., 26.1-gravity, 2 per cent cut, T.D. 4,644 ft., perf. 4,391-4,411 ft., 4,490-4,505 ft., completed in Middle zone at base of Pliocene.

H. C. Morton 3 Brooks, 34-5s-11w, pumped 135 bbl., 24.1-gravity, 0.3 per cent cut, T.D. 4,797 ft., perf. 4,529-49 ft., 4,621-49 ft., completed in Middle zone of Pliocene age.

Signal O. & G. Co. 31-A Bolsa Chica, 33-5s-11w, flowed 660 bbl., 25.2-gravity, 1 per cent cut, 9/64-in. bean, pressures 400/650 lb., T.D. 4,238 ft., perf. 3,224-3,560 ft., 3,599-4,100 ft., completed in Bolsa Chica oil zone of Pliocene age.

Seal Beach wildcat district, Orange County: South Basin Oil Co. 1 S.B.J.A., 6-5s-11w, abandoned as dry hole, T.D. 8,014 ft., top Repetto 5,347 ft., Alamitos shale 5,875 ft., Alamitos brown shale 6,910 ft., abandoned in formation of Pliocene age.

Wilmington, Los Angeles County: Dolley & Long 2-C Padreson, 33-4s-13w, pumped 160 bbl., 13.8-gravity, 2 per cent cut, T.D. 3,600 ft., perf. 2,672-2,878 ft., 2,910-3,090 ft., 3,726-3,470 ft., 3,530-3,600 ft., completed in Ranger zone of Miocene age.

Pacific Western 1 Rush Comm., 33-4s-13w, pumped 180 bbl., 15.1-gravity, 12 per cent cut, T.D. 3,520 ft., perf. at intervals 2,566-3,520 ft., recompleted in Ranger zone after hole redrilled and deepened from 2,829 ft.

Royalty Service Corp. 4-B Nelson, 33-4s-13w, pumped 87 bbl., 14-gravity, 15 per cent cut, T.D. 3,499 ft., perf. 2,979-3,499 ft., recompleted in Ranger zone after hole redrilled to 3,499 ft. and gravel packed.

Union Pacific R. R. 37-E Edison, 3-5s-13w, flowed 60 bbl., 27.9-gravity, 3 per cent cut, 28/64-in. bean, pressures 400/780 lb., T.D. 3,975 ft., perf. 3,518-90 ft., 3,684-3,782 ft., 3,840-3,903 ft., 3,913-68 ft., completed in lower Terminal zone of Miocene age.

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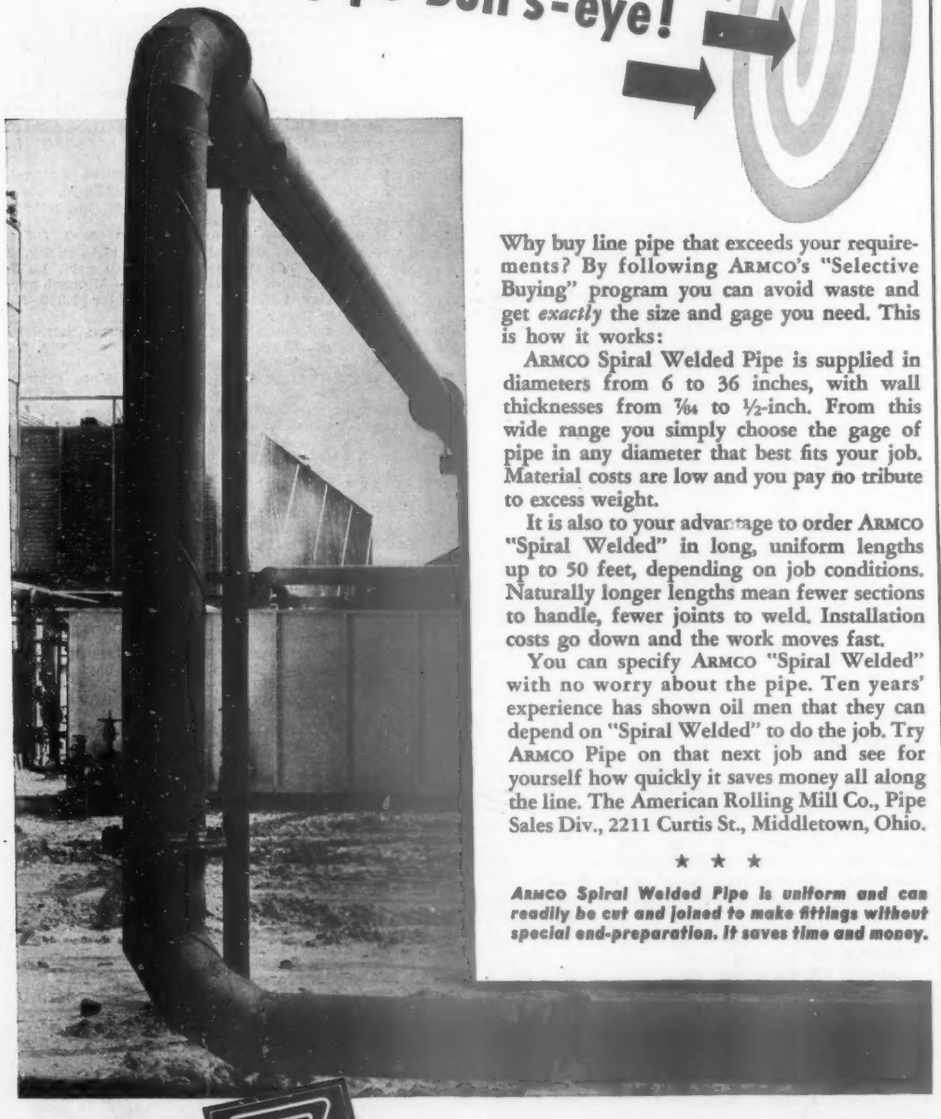

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Union Pacific R. R. 195 fee, 4-5s-13w, flowed 52 bbl., 28.7-gravity, 2 per cent cut, 50,000 cu. ft. gas, 12/64-in. bean, pressures 100/850 lb., T.D. 5,520 ft., 60-mesh perf. 5,080-5,185 ft., 5,306-66 ft., 5 466-5,5 0 ft., completed in Ford zone of Miocene age.

Union Pacific R. R. 205 fee, 3-5s-13w, flowed 2,386 bbl., 28.5-gravity, 0.1 per cent cut, 28/64-in. bean, pressures 430/690 lb., T.D. 3,450 ft., perf. 2,579-2,692 ft., 2,711-26 ft., 2,760-89 ft., 3,031-3,140 ft., 3,154-69 ft., 3,183-3,302 ft., 3,325-77 ft., 3,391-3,444 ft., completed in upper and lower Terminal zones of Miocene age.

Union Pacific R. R. 206 fee, 3-5s-13w, flowed 543 bbl., 23.3-gravity, 0.9 per cent cut, 36/64-in. bean, pressures 535/850 lb., T.D. 2,685 ft., perf. 2,389-90 ft., 2,409-67 ft., 2,487-2,682 ft., completed in Ranger zone of Miocene age.

Union Pacific R. R. 208 fee, 9-5s-13w, flowed 298 bbl., 17.1-gravity, 1.1 per cent cut, 70,000 cu. ft. gas, pressures 50/580 lb., T.D. 3,548 ft., perf. 2,865-2,929 ft., 2,944-80 ft., 3,047-90 ft., 3,337-3,447 ft., 3,488-3,541 ft., completed in Ranger zone of Miocene age.

Wilbur, V.R.G. 2 Kreiger, 32-4s-13w, pumped 162 bbl., 13.6-gravity, 5 per cent cut, T.D. 3,675 ft., perf. 2,726-2,837 ft., 2,960-3,060 ft., 3,109-3,290 ft., 3,329-3,675 ft., recompleted after being redrilled and deepened from 3,670 ft.

LOS ANGELES BASIN OUTPOSTS OR DEEP TESTS

Dominguez, Los Angeles County: Decker and Associates 1 Frome, 29-3s-13w, T.D. 7,268 ft. in oil sand, 7-in. casing cemented 7,247 ft., formation test showed little oil and water.

Inglewood, Los Angeles County: Jefferson Oil Co. 2 Smith, 7-2s-14w, derrick.

Hogan Pet. Co. 4-A Machado, 7-2s-14w, drilling in sand 784 ft.

Texas Co. 8 Smith, 7-2s-14w, T.D. 8,412 ft. in oil sand, top Nodular 7,840 ft., redrilled 6,730 ft., ran into old hole, backed up, now redrilling 7,297 ft., elev. 242 ft.

Tide Water Associated 71 Vickers, 7-2s-14w, rigging up.

Tide Water Associated 72 Vickers, 7-2s-14w, drilling 7,870 ft. in hard shale, elev. 350 ft.

Potrero, Los Angeles County: Tide Water Associated 5 Cypress, 34-2s-14w, rigged up.

LOS ANGELES BASIN WILDCATS

Buena Park district, Orange County: Texas 1 Spencer, 1-4s-11w, rigging up rotary tools.

Costa Mesa district, Orange County: M. N. Thompson 1 Banning, 9-6s-10w, T.D. 5,645 ft., redrilling 4,270 ft., cleaning out sand bridges.

Huntington Beach district, Orange County: La Bolsa Rancho Syndicate 1 La Bolsa, 22-5s-11w, rigged up.

Palos Verdes district, Los Angeles County: Newton Dev. Co. 1 P.V., 13-5s-15w, T.D. 4,215 ft. in hard sand, reaming.

Puente district, Orange County: Sunset Oil Co. 1 Baldwin, 11-2s-11w, T.D. 4,681 ft. in hard gray sand and black shale with streaks of conglomerate and oil sand, top Kraemer shale 3,888 ft., gun perf. 3,706-10 ft., 3,721-25 ft., bailed dry, may abandon.

Rio Hondo district, Los Angeles County: Potrero Oil Co. 1 Newman, 32-1s-11w, drilling 198 ft. in sand, located 1 mile north of eastern tip of Montebello field, elev. 145 ft.

Whittier district, Los Angeles County: Los Nietos Valley Oil Co. 1 Los Nietos, 29-2s-11w, rigged up.

Union 13 Sansinena, 30-2s-10w, rigged up.

Rincon Record Deep Test Held Up by Fishing Job

The deepest drilled hole in the Rincon field, 3-C Hobson of Chanslor-Canfield Midway Oil Co., is being held up with a fishing job which resulted when the drill pipe froze at 9,491 ft. while the crew was cleaning out preparatory to landing liner. This deep well is down 10,515 ft. but has been plugged back to 10,090 ft. and the impending test will be made of the interval at 9,048-10,090 ft. The sand found in this well at 9,048-10,515 ft. contains considerable oil sand but it is very tight and, lacking favorable porosity and permeability, is not expected to show large production. Some method may ultimately be devised to cope with a situation of this kind but at the present time there is very little that can be done to bring the oil and gas into the hole. Continental Oil Co. has a similar problem in the Shafter region of Kern County where the oil sand is very tight although productive in a measure.

COASTAL DISTRICT COMPLETIONS

Del Valle, Los Angeles County: Bankline Oil Co. 101 Videgain, 17-4n-17w, flowed 370 bbl., 31.5-gravity, 2 per cent cut, 360,000 cu. ft. gas, 24/64-in. bean, pressures 175/750 lb., T.D. 7,700 ft., P.B. 6,132 ft., flowed barefoot, top Miocene 5,858 ft., first oil zone 6,101-6,213 ft., second Miocene zone 6,430-75 ft.

Newhall-Potrero, Los Angeles County: Barnsdall 27 R.S.F., 27-4n-17w, flowed 1,630 bbl., 33.5-gravity, 0.2 per cent cut, 1,100,000 cu. ft. gas, 32/64-in. bean, pressures 685/0 lb., T.D. 7,301 ft., perf. 7,050-7,299 ft., completed in third Modelo zone 7,050-7,301 ft. of Miocene age.

Padre Canyon, Ventura County: General Pet. 2 Padre, 15-3n-24w, pumped 110 bbl., 26.9-gravity, 5 per cent cut, T.D. 5,710 ft., perf. 5,328-79 ft., 5,440-5,535 ft., 5,645-5,708 ft., completed in Hobson zone of Pliocene age.

Piru wildcat district, Ventura County: Western Gulf

(Continued on Page 86)

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A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

New Colby Sand Pool Opened East of Emperor Field

By TOM BARBER

MIDLAND, Tex., Nov. 17.—A new Colby sand lime pool in southern Winkler County was opened this week with the completion of Ted and Sam Weiner 1-B Halley, Section 7, Block B-11, P.S.L. Survey. On official Railroad Commission gage the discovery rated a potential of 370 bbl. of oil daily, flowing through ¾-in. choke on tubing. Oil tested 33.5° A.P.I. gravity and the well registered a gas-oil ratio of 2,100-1. No. 1-B Halley logged the Colby section at 3,000 ft. and drilled to a total depth of 3,210 ft. The test was given a 460-qt. shot of nitro, after which it flowed 180 bbl. of oil in 12 hours through 2-in. outlet on casing.

The new discovery is only 1 mile east of the Emperor pool but produces from a different horizon, the Colby sandy lime, which is the producing formation for the Keystone pool 7 miles north. Two previous efforts of the operators in the immediate vicinity of the discovery were junked when hole was lost.

Devonian Test in Winkler County Is Plugged Back

In the meantime, the deepest test to be drilled in Winkler County, Magnolia 20 State-Walton, Section 4, Block B-3, P.S.L. Survey, is making preparations to test higher in the Permian section. Drilled to 8,445 ft. in the Devonian chert, the wildcat was plugged back to 5,504 ft. to test in the lower Permian, after it failed to find production in any of the regular horizons of nearby fields.

Operator set 7-in. casing at 8,338 ft. and 2-in. tubing at 5,481 ft. and then gun-perforated both in the lower Permian lime from 4,900-10 ft. Immediately after casing was shot, the test built up 250 lb. pressure and flowed out a 50-bbl. oil load but swabbing developed sulfur water and, at the end of the week, operator had squeezed off perforations and was waiting on cement testing higher in the section.

Additional shows in the project were encountered from 4,850-4,980 ft., 5,338-5,400 ft., 5,750-5,800 ft., 7,100-7,200 ft., and 7,500-25 ft. Each of these shows will be tested in an effort to complete the wildcat as an oil producer. However, in the event that production is not obtained, operator is keeping the hole in condition for deepening to the Ordovician, original objective.

Crane County Discovery Well Gaged

Completion was reported this week on the Crane County discovery drilled by Continental at 1 E. B. Jones, Section 12, Block 3, H.&T.C. Survey. On its last gage the well, with the aid of eight flow valves, flowed 83.05 bbl. of oil in 24 hours through ⅛-in. tubing choke. Oil tested 42.3° A.P.I. gravity and gas-oil ratio was 1,296-1. No. 1 Jones was drilled to 6,146 ft. and plugged back to 6,015 ft. after it failed to find production in the Ellenburger. The well is producing from the Simpson sand at 5,700 ft. following a 2,000-gal. acid treatment.

Location is 660 ft. out of the north corner of the section and 1½ miles south of the Sand Hills south extension area in the western part of the county.

The Sand Hills Ordovician field proper is facing its first setback. Gulf 6-A Tubb, Section 20, Block B-27, P.S.L. Survey, south offset to the firm's 3-A Tubb, found Ellenburger lime low after becoming the first test in the area to log the Simpson and is threatening to limit production on the south side. This possibility gives rise to the speculation of whether or not the field will be linked with its south extension area, as previously indicated at Gulf 1-B Tubb, Section 28, Block B-27, P.S.L. Survey.

At the present time, 6-A Tubb is awaiting orders at 5,887 ft. in dolomite. A 45-minute drill-stem test from 5,851-67 ft. recovered 30 ft. of drilling fluid only. The top of the Simpson was logged at 5,760 ft.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hr. rating on last 3 hr. of 6-hr. gage)

Wildcat

Crane County: Continental 1 E. B. Jones, elev. 2,474 ft., 83 bbl., ⅛-in. choke, top Yates 1,380 ft., top Simpson 5,548 ft., top Ellenburger 6,040 ft., 3,500 gal. acid 6,004-15 ft., P.B. from 6,146 ft.

Fields

Abell, Pecos County: Magnolia 1 Graova-State, elev. 2,389 ft., 216 bbl., ½-in. choke, top Tulip Creek 4,900 ft., top Crockett sand 4,953 ft., pay 5,441-50 ft.

SUMMARY OF COMPLETIONS

Southern West Texas

	No.	Bbl.	Footage
Oil wells: Johnson	2	609	8,485
Keystone	4	940	13,266
McElroy	4	1,234	12,394
Taylor-Link	2	493	3,302
Other fields	6	1,755	22,916
Wildcats	1	83	6,146
Total	19	.....	66,509

Northern West Texas

	No.	Bbl.	Footage
Oil wells: Emma	3	3,417	12,781
Seminole	1	270	5,245
Sharon Ridge	3	446	6,662
Slaughter	7	8,450	35,170
Wasson	3	678	15,398
Dry holes: Fields	1	.....	2,455
Total	18	.....	77,711

Texas Panhandle

	No.	Bbl.	Footage
Oil wells: Fields	13	2,535	39,690
Gas wells: Fields	3	*49.6	8,976
Total	16	.....	48,666

Southeast New Mexico

	No.	Bbl.	Footage
Oil wells	6	459	16,024
Dry holes	1	.....	4,613
Total	7	459	20,637

*Million cu. ft.

Abell-Permian, Pecos County: Stanolind 1 Louis Rathjen, elev. 2,368 ft., 759 bbl., ½-in. choke, 500,000 cu. ft. gas, pay 3,850-3,950 ft.

Emperor Deep, Winkler County: Sam Weiner 1-B Halley, elev. 2,797 ft., 370 bbl., ¾-in. choke, top Yates 2,318 ft., top lime 2,250 ft., 460-qt. shot 3,005-3,205 ft., T.D. 3,210 ft.

Halley, Winkler County: Skelly Oil 43 Halley, elev. 2,733 ft., 60 bbl., pumping, 490-qt. shot 2,738-2,992 ft., P.B. from 3,211 ft.

Harper, Ector County: Forest Dev. Co. 6-A Moss, elev. 2,924 ft., 254 bbl., 585-qt. shot 4,080-4,275 ft.

Hendrick, Winkler County: Phillips 9 McCabe, elev. 2,802 ft., 96 bbl., 24/64-in. choke, 125-qt. shot 2,769-2,820 ft.

Johnson, Ector County: Cities Service 1-G J. L. Johnson, elev. 2,982 ft., 186 bbl. oil and 2 per cent water, 1-in. choke, 256-qt. shot 4,115-4,215 ft.

T. P. Coal & Oil 6 Johnson, elev. 2,964 ft., 423 bbl., pumping, 530-qt. shot 4,160-4,270 ft.

Keystone, Winkler County: Ralph Lowe 4 Zachary est., elev. 2,885 ft., 143 bbl., pay 3,088-3,280 ft.

Parker Drilling Co. 3 Ward, elev. 2,881 ft., 105 bbl., ½-in. choke, 250-qt. shot 3,190-3,295 ft.

Standard 12-19 Baird, elev. 2,912 ft., 297 bbl., 260-qt. shot 3,235-3,340 ft., T.D. 3,346 ft.

Standard 14-19 Baird, elev. 2,905 ft., 395 bbl., 260-qt. shot 3,235-3,337 ft., T.D. 3,345 ft.

McElroy, Crane County: Gulf 52 McElroy, elev. 2,568 ft., 232 bbl., pumping, 710-qt. shot 2,760-2,950 ft., T.D. 2,960 ft.

McElroy, Upton County: Gulf 10-A Grier-McElroy, elev. 2,572 ft., 146 bbl., 250-qt. shot 2,985-3,029 ft., T.D. 3,039 ft.

Gulf 257 McElroy, elev. 2,756 ft., 566 bbl., 910-qt. shot 2,904-3,130 ft., T.D. 3,140 ft.

T. P. Coal & Oil 2-A Bell, elev. 2,824 ft., 290 bbl., pumping, 2,000 gal. acid and 850-qt. shot 2,915-3,255 ft.

Taylor-Link, Pecos County: Lambreth 6-K University, elev. 2,568 ft., 190 bbl., pumping, 2,000 gal. acid 1,636-79 ft.

Sam Letwin 3-E University, elev. 2,512 ft., 303 bbl. oil and 13 bbl. water, ¾-in. choke, 1,500 gal. acid 1,610-23 ft.

SOUTHERN WEST TEXAS ACTIVE WILDCATS

Crockett County: Amerada 1-G Todd estate, G.C.&S.F. Sur., Sec. 15, Blk. WX, 660 ft. from S and E lines, Ordovician test, drilling 315 ft.

Humble 1 J. W. Owans, SW SE Sec. 8, Blk. GG, H.E.&W.T. Sur., drilling 1,019 ft.

Jacobs & Gibson 1 University, Sec. 5, Blk. 29, University Sur., 990 ft. from S and E lines, drilling 850 ft.

J. S. Pittman 1 Bouscaren, 467 ft. from N and W lines, Sec. 29, Blk. HH, H.E.&W.T. Sur., 2,500 ft. test, drilling 2,000 ft.

Ector County: Oil Well Drilling Co. 1 J. L. Johnson, T.&P. Sur., Blk. 14, Sec. 48, Twp. 1s, 467 ft. from N and W lines, 4,500-ft. test, waiting on cement 175 ft.

Glasscock County: E. M. Wahlenmaier 1 Texas Ld. & Tr., 467 ft. from W and S lines, Sec. 15, Blk. 34, T.&P. Sur., 3,500-ft. test, drilling 2,885 ft.

Irion County: B. C. Mann 2 Read, Sec. 3, Blk. 17, H.& T.C. Sur., 2,310 ft. from N and 660 ft. from W lines of section, 700-ft. test, first report.

Pecos County: Cardinal Oil 1-3 University, 1,715 ft. from N and 2,370 ft. from W lines, Sec. 3, Blk. 17, University Sur., S.D. 1,588 ft., waiting orders after P.B. from 1,604 ft.

J. L. Cooper 1 University, 330 ft. from S and E lines, Sec. 13, Blk. 16, University Sur., drilling 1,485 ft.

Gulf 2 Millar, C NW SE Sec. 43, Blk. 11, H.&G.N. Sur., Ordovician test, drilling 4,160 ft.

Jameson & Pollard 1 University, 1,980 ft. from W and S lines, Sec. 34, Blk. 27, University Sur., 3,000-ft. test, spudded in and S.D.

Regan County: Amerada 1-RB University, 660 ft. from N and W lines of NE Sec. 8, Blk. 48, University Sur., drilling 7,020 ft.

Amerada 1-RC University, 660 ft. from S and E lines, NE Sec. 4, Blk. 48, University Sur., S.D. 2,420 ft. after P.B. from 2,790 ft.

Sutton County: S. B. Roberts 1 George Allison, NW NE Sec. 44, Blk. K, G.H.&S.A. Sur., straightening hole 760 ft.

Upton County: Plymouth 1 Alford, C Sec. 50, Blk. 12, P. B. Scott Sur., running 7-in. casing 10,194 ft.

Ward County: Shell 1 Sealy-Smith, 2,310 ft. from S and 330 ft. from E lines, Sec. 38, Blk. A, G.M.M.B.&A. Sur., Ordovician test, drilling 7,297 ft.

Winkler County: Magnolia 20 States-Walton, NW cor. Sec. 4, Blk. 3-B, P.S.L. Sur., waiting on cement 5,484 ft., P.B. from 8,445 ft.

Sam Weiner 1 Halley, NW NE Sec. 7, Blk. 11-B, P.S.L. Sur., S.I. 3,023 ft.

Union Oil 1 W. C. Driver, Sec. 19, Blk. B-6, P.S.L. Sur., 660 ft. from N and W lines of section, first report.

NORTHERN WEST TEXAS

With indications last week and again this week of possible new producing areas in the northern Permian basin, wildcat exploration gained new impetus. Wildcats in Yoakum and Dawson counties are testing possible pay horizons while a Lubbock County wildcat has logged an oil show. During the week, four new wildcat locations were staked.

The Yoakum County wildcat, which is showing for oil production, is Sinclair Prairie 1 C. J. Kleiner, located in the northwest corner of Section 436, Block D, J. H. Gibson Survey, 3½ miles northwest of the Ownby pool. No. 1 Kleiner has been bottomed at 5,450 ft., after logging intermittent shows from 5,366 ft. to total depth. A 15-minute drill-stem test at 5,339-5,400 ft. recovered 2,700 ft. of gas-cut drilling mud. A second test from 5,395-5,436 ft. also recovered gas-cut mud with an odor of oil. Operator has set 7-in. casing at 5,400 ft. and at the end of last week was swabbing preparatory to testing.

In Dawson County, Ray Albaugh and Richmond Drilling Co. 1 J. J. Handley has been given a 700-qt. nitro shot in the pay section from 4,910-77 ft. and operators are cleaning out gravel tamp. The wildcat is bottomed at 4,980 ft. On its last natural test, 1 Handley swabbed 35 bbl. of oil and bailed 205 bbl. of water in 24 hours. If completed for oil production, 1 Handley will be the first commercial oil producer in Dawson County. Location is in the SE SW of Section 36, Block M, E.L. Survey.

Three and one-half miles northwest of Lubbock County's first discovery well, Harrison 1 Nairn, which last week was completed for 165 bbl. of oil daily from 4,870-5,002 ft., the same operator in association with Tobe Foster is drilling 1 Steck. Located in Section 7, Block A, J. H. Gibson Survey, 1 Steck is reported coring below 5,000 ft. in the Clear Fork lime of the Permian section, after encountering oil shows in drilling to that depth.

Wildcat Locations

In the same county, 15 miles southwest of the town of Lubbock, Benson & Roach will drill 1 Stanolind-Texas Land & Mortgage, a scheduled 6,000-ft. wildcat. The test will be drilled on a 320-acre farmout block from Stanolind and is located in the SW SW of Section 64, Block 20, H.E.&W.T. Survey. Under contract terms, drilling will start on or before December 15.

A 5,000-ft. wildcat test has been staked in Dawson County, 9½ miles southeast of Albaugh 1 Handley, by Ray Albaugh as 1 J. R. Weaver. The test will be drilled on a block of 5,288 acres in Tract 15, League 1, Taylor C.S.L. Survey.

In the southern part of Andrews County, the Fuhrman Petroleum Co. will drill 1 M. A. Thornberry in the southwest corner of Section 23, Block A-42, P.S.L. Survey. No. 1 Thornberry is 3 miles west of the Fuhrman pool but only 4,555 ft. southeast of the discovery well in the West Fuhrman area. The wildcat is contracted to 4,600 ft.

C. E. Hyde and Dean Bros. have spudded a sched-

uled 3,800-ft. cable-tool wildcat in southwestern Borden County. The wildcat will be drilled as 1 W. L. Miller, 2,651 ft. from the south and 2,264 ft. from the east lines of Section 10, Block 33, Township 4n, T.&P. Survey.

Ownby Pool Extended to South

A ⅝-mile south extension to the Ownby pool of

(Continued on Page 81)

TEXAS PANHANDLE

AMARILLO, Tex., Nov. 17.—The Panhandle district had 16 tests completed during the past week, 13 for oil wells and 3 gas wells. The daily potential of the 13 oil completions amounted to 2,860 bbl. and the three gassers has a total daily yield of 49,600,000 cu. ft. The best completion for the week was in the Taylor field of Gray County where the Clayton & Dwyer 7 Lovett pumped 65 bbl. in 4 hours and rated a daily potential of 390 bbl.

During the week, 26 new locations were announced for the district, a decline of nine from the previous week. Gray County led the field with 11 new locations; Hutchinson County had nine, Moore County four, and Carson and Wheeler counties one each.

TEXAS PANHANDLE COMPLETIONS

(24-hr. gage)

Carson County: Cities Service Oil 42-A Burnett, Sec. 56, Blk. 5, I.&G.N. Sur., 24,600,000 cu. ft. gas, T.D. 2,840 ft.

Gray County: Clayton & Dwyer 7 Lovett, Sec. 36, Blk. B-2, H.&G.N. Sur., 65 bbl., pumping, 560-qt. shot 2,830-2,970 ft.

Phillips 3 Tay, Sec. 24, Blk. B-2, H.&G.N. Sur., 110 bbl., pumping, 410-qt. shot 2,940-3,020 ft.

Wilcox Oil & Gas Co. 38 Worley-Reynolds, Sec. 61, Blk. 3, I.&G.N. Sur., 275 bbl., pumping, pay 3,028-40 ft.

Hutchinson County: Continental 3-C Sanford, Sec. 79, Blk. 46, H.&T.C. Sur., 195 bbl., pumping, 2,500 gal. acid. 2,815-26 ft., T.D. 2,831 ft.

Gulf 107 Dial, Sec. 2, Blk. 1, H.&G.N. Sur., 108 bbl. oil and 33 bbl. water, pumping, 530-qt. shot 2,930-3,066 ft.

McIlroy & Herrmann 17 Halle, Sec. 4, Blk. M-21, T.C. Sur., 195 bbl., pumping, 200-qt. shot 2,970-95 ft., T.D. 3,000 ft.

Phillips 7 Supreme, Sec. 25, Blk. M-23, T.C. Sur., 268 bbl., pumping, 460-qt. shot 3,200-73 ft., T.D. 3,275 ft.

Phillips 8 Timms, Sec. 21, Blk. M-21, T.C. Sur., 318 bbl., pumping, 500-qt. shot 3,083-3,198 ft., T.D. 3,205 ft.

Phillips 60 Whittenburg, Sec. 58, Blk. 46, H.&T.C. Sur., 223 bbl., pumping, 460-qt. shot 2,778-2,853 ft.

Shell 36-B Harvey Sisters, Sec. 41, Blk. M-21, T.C. Sur., 303 bbl., pumping, 165-qt. shot 3,020-89 ft.

Stanolind 2 Jasper, Sec. 24, Blk. M-23, T.C. Sur., 147 bbl., pumping, 460-qt. shot 3,125-3,211 ft.

Stanolind 13 Lewis, Sec. 7, Blk. 23, B.S.&F. Sur., 191 bbl., pumping, 540-qt. 2,900-3,010 ft., T.D. 3,064 ft.

Texas 39 Lewis, Sec. 5, Blk. 23, B.S.&F. Sur., 137 bbl., pumping, 534-qt. shot 2,970-3,060 ft., T.D. 3,066 ft.

Moore County: Texoma Natural Gas Co. 10-M Coon-Sneed, Sec. 15, Blk. 6-T, T.&N.O. Sur., 16,700,000 cu. ft. gas, pay 2,792-3,262 ft.

Texoma Natural Gas Co. 27-P Sneed, Sec. 1, T.T. Sur., 8,300,000 cu. ft. gas, pay 2,365-2,625 ft., T.D. 2,874 ft.

Discovery Well North of Grayburg Pool Flows 77 Bbl. of 38.2-Gravity Oil

HOBBS, N. M., Nov. 17.—Sanders Brothers 1 Harry Leonard, opening a new lime area 2¾ miles north of the Grayburg pool in Eddy County, Southeast New Mexico, has been completed for a daily flow of 77 bbl. of 38.2-gravity oil.

The discovery well was gaged through open 2-in. tubing set at 2,900 ft. Gas accompanying oil measured 49,326 cu. ft. per day. No. 1 Leonard, already the forerunner of other wildcatting activity in the area, logged best pay in lime from 2,953-65 ft. and is bottomed at 2,982 ft. in lime. It was shot with 120 qt. from 2,940-80 ft. Location is in NW SW 34-16-30.

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcat, Eddy County: Sanders Bros. 1 H. Leonard, NW SW 34-16-30, flowed 77 bbl. through 2-in. tubing from 2,953-65 ft., T.D. 2,982 ft. *Opens North Grayburg pool.*

Wildcat, Lea County: Culbertson & Irwin 1 E. M. Wingfield, NE NW 4-19-25, dry at 4,613 ft., P.B. from 4,634 ft., logged showings of oil and gas at 4,348-50 ft., 4,435-37 ft. and 4,500-04 ft.

Grayburg, Eddy County: Etz 7 State, 16-17-30, flowed 25 bbl. through ¼-in. choke with 4,000,000 cu. ft. gas, shot, pay 2,065-2,109 ft.

Premier Pet. 1-F McEntyre, 17-17-20, flowed 22 bbl. through ½-in. choke, shot, pay 2,060-90 ft.

Red Lakes, Eddy County: Paton Bros. 2 Magruder, SW NE SE 35-17-27, pumped 40 bbl., acid, 484-500 ft.

Maljamar, Lea County: Maljamar 7-A William Mitchell, 20-17-32, flowed 80 bbl. through ½-in. choke, shot, 3,980-4,048 ft., first pay noted at 3,670 ft.

Drilling & Exploration 1-A-24 Johns, 24-17-32, flowed 215 bbl. through 6/16-in. choke, pay 3,900 ft., T.D. 4,300 ft.

TEXAS GULF COAST

New Deep Wilcox Field in Prospect in Montgomery Co.

By NEIL WILLIAMS

HOUSTON, Tex., Nov. 17.—Developments along the Wilcox trend continue to hold main interest along the Texas Gulf Coast district. As the week ended preparations were being made to test a prospective pool opener in the Fostoria area, northeastern Montgomery County, while an important southeast extension was indicated for the Provident City field, La Vaca County. In addition a southeast extension was recorded for the Lake Creek field, Montgomery County, and locations for additional Wilcox activity was reported.

The prospective pool opener in the Fostoria area, Montgomery County, is Atlantic 1 Foster Lumber Co., located in the P. Gill Survey. Total depth of the hole is 11,794 ft., and after running an electrical log and cutting sidewall cores, a plug was set at 10,868-10,555 ft., and the company drilled out to 10,600 ft., at which depth liner was being set for a production test. Like most of the wells drilled along the trend, little information has been released, and it is not known where the well will be tested. The well is on strike with the Lake Creek and Magnolia fields. As development along the trend becomes more widespread all indications point to a general deep-drilling program. This has been brought about by the discovery of additional sands several thousand feet below the top of the Wilcox and the majority of the wells that have been drilled along the trend since the first of the year have been drilled to a depth of 10,000 ft. or deeper.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	18	3,788	110,884
Gas wells: Fields	3	.....	14,210
Dry holes: Wildcats	2	.....	10,625
Total	23	.....	135,719

The Provident City field, Lavaca County, opened shortly after the first of the year, was promised its second producer as Shell Oil Co., Inc., prepared to test 1 Neuhaus, about 1 mile southeast of the discovery well in the John Ragsdale Survey. Five and one-half inch casing was reported to have been cemented on bottom at 10,175 ft., preparatory to testing several sands in the Wilcox below 8,000 ft. The discovery well of the field was completed as a gas-distillate producer at 8,468-71 ft.

Lake Creek Extended to Southwest

Gas-distillate production was extended several hundred feet southwest in the Lake Creek field, Montgomery County as Superior Oil Co. of California 1-B McWhorter was flowing ungaged while testing through perforated casing at 9,764-98 ft. This is the deepest test ever drilled along the Texas Coast, having reached a depth of 13,330 ft. and said to be still in the Wilcox section. Testing at intervals from 12,237 ft. to 9,700 ft. showed salt water, gas, and distillate. Whether the well will be killed and retested up the hole was not announced by the company. Location for 1-C McWhorter was made about 700 ft. southwest of the present well. North of the well and offsetting production, Stanolind Oil & Gas Co. 1 T. A. McWhorter is bottomed at 10,663 ft. and 7-in. casing was being cemented. This company is also rigging up for its second operation, being a west offset to the discovery well.

The trend gained two new operations as H. C. Cockburn moved in for an 8,800-ft. test in Newton County, located on the Texas Forest Service-A. & M. College lease in the John T. Lewis Survey. Southwest of the Joe's Lake field, about 1 mile, Republic Production Co. and Houston Oil Co. staked location for 1 Cushing-fee in the Theo Cushing Survey. The location is about 1 mile south of the company's 1 Smith-fee, which is drilling in a sidetracked hole below 6,500 ft., and is northwest of the new Fred field in the southeastern part of the county.

Polk County Wildcat Reports

Cockfield Production

Pan American Production Co. 1 Texas Long Leaf Lumber Co., a wildcat located in the Goodrich area, Polk County, continues to attract attention as possible production from the Cockfield sand has been indicated. With the hole bottomed in a sidetracked hole at 4,054 ft., the well was tested through perforated casing at 4,030-34 ft., and it flowed at the rate of about 9 bbl. of fluid per hour through a ¼-in. choke of which 50 per cent was cut oil and the balance salt water. Additional tests were expected to be made the first of the week.

North La Ward Outposts Ready for Test

Operators interested in development of the new North La Ward field, Jackson County, were watching the outcome of scheduled production test on two important outpost wells located south and southwest of production. Gulfboard 1 Dickey, 4,500-ft. southwest, flowed gas and wash water through a ½-in. choke when tested through perforated casing at 5,216-24 ft., and the company had cemented off perforations preparatory to retesting. About the same distance south, Moore & Ahern 1 Badet, I.&G.N. Survey 5, is bottomed at 5,277 ft., with 5½-in. casing at 5,270 ft. Broken sand and shale showing oil were cored at intervals from 5,209-64 ft.

In the south extension area, and located as a south offset to Christie & Dunnam 1 Pickering, Phillips 1 J. B. Johnson recovered 500 ft. of pipe-line oil on a 12-minute drill-stem test at 5,200-14 ft., and 5½-in. casing was cemented at 5,279 ft. Total depth of the hole is 5,280 ft. In the meantime, Magnolia 2 Gordon, located in the discovery area, was completed through perforated casing at 5,210-20 ft. for an initial production of 156 bbl. daily through a 9/64-in. choke, and the company is moving in material for 5 Gordon, midway between 1 Badet and the discovery well. As the two south-extension wells were preparing to test, interest in the field was shifted to Edwin M. Jones 1 Olsovsky, 4,500 ft. northeast of production which is drilling below 4,800 ft., and should reach the expected pay by the first of the week.

An extension of several hundred feet was assured the Lucky field, Matagorda County, as Stanolind 1 Thompson flowed 29 bbl. of distillate plus 4 per cent salt water through a ½-in. choke from perforated casing opposite sand at 8,930-40 ft. At the close of the week the well was being killed in an attempt to eliminate the salt water.

North of Rosenberg, Fort Bend County, Magnolia Petroleum Co. farmed out approximately 2,000 acres to H. L. Hunt who is moving in material for 1 Moore estate, located in the B.B.B.&C. Survey. In Jefferson County, W. P. Luse et al announced location for 1 Lenora Kemp, a wildcat located in the David Burrell Survey. Derrick is up and the well is scheduled to be spudded the first of the week.

TEXAS GULF COAST COMPLETIONS

Wildcats

Fayette County: M. H. Miller 1 Holmcamp, dry, T.D. 2,896 ft.

Washington County: John Deering 1 H. C. Buck, dry, T.D. 7,729 ft.

Fields

Dyersdale, Harris County: H. C. Cockburn 26 Burkett, 367 bbl., ¼-in. choke, T.D. 4,077 ft.

Jack Frazier 1 Kenedy, 800,000 cu. ft. gas, T.D. 4,135 ft.

Esperson, Liberty County: General Crude 28 Davis, 79 bbl., ¼-in. choke, gas lift, T.D. 8,438 ft., P.B. T.D. 8,380 ft.

Fannett, Jefferson County: Gulf 9-E Marrs-McLean, 791 bbl., ¼-in. choke, T.D. 8,517 ft., P.B. T.D. 8,398 ft.

Lolita, Jackson County: Humble 21-A L. Ranch, 528 bbl., ¼-in. choke, sand 5,925-28 ft.

Magnolia 7 Four Way Ranch, 143 bbl., 7/64-in. choke, perf. casing 6,945-48 ft., T.D. 5,948 ft.

Magnolia 15 Mitchell, 160 bbl., ½-in. choke, perf. casing 5,935-38 ft.

Magnet, Wharton County: Humble 44 Cockburn, 97 bbl., ½-in. choke, sand 5,541-43 ft.

Maurbro, Jackson County: Stanolind 1 McCrory-Westhoff, 151 bbl., ½-in. choke, perf. casing 5,222-32 ft., T.D. 5,243 ft.

Navidad, Jackson County: W. S. Boyle 1 Whitely, dry-gas well, no gage, perf. casing 4,053-60 ft., T.D. 5,010 ft.

North La Ward, Jackson County: Magnolia 2 Gordon, 156 bbl., 9/64-in. choke, perf. casing 5,210-20 ft., T.D. 5,237 ft.

North Markham, Matagorda County: Ohio 12 Carlson,

(Continued on Page 88)

High Royalties Given in Sale Of Montana Indian Lands

By T. R. INGRAM

DENVER, Colo., Nov. 17.—A sale of Blackfeet Indian tribal leases in proven territory at the south end of the Cut Bank field in Montana carrying a royalty of 17½ per cent was an outstanding development in the Rocky Mountain area the past week. Coming at a time when western oil men are attempting to obtain a flat rate of 12½ per cent on the public domain, either by edict of Secretary of the Interior Ickes or congressional action, the sale bore some earmarks of being a challenge to those favoring a reduction in the royalty rates.

The call for bids specified a royalty of "at least" 15 per cent, but before the sale began Roy Nash, Blackfeet Indian agent, announced that the Tribal Council had voted that no sale shall be made for less than 17½ per cent. The royalty heretofore on tribal land had carried a straight 12½ per cent royalty. In spite of the change in the rate, the sale established a record price. The four tracts of tribal land are in Sections 19 and 29-32n-5w, and 13-32n-6w, and are in what is considered proven territory. The record bid was $214 an acre for 80 acres in the S½ SW 19-32n-5w made by A. B. Cobb. Dr. D. S. McKenzie, of Havre, bid $187 per acre for 80 acres in S½ NW 29-32-5. Two tracts in 13-32-6 went to Hannah-Porter for $55.89 and $56.17 an acre. The lease calls for two wells on each tract.

Other leases sold carried a royalty of 12½ per cent and included one allotted tract in proven territory in W½ SW 13-32-6 which went to G. S. Frary for $30 an acre. Included in the sale were 1,080 acres in five tracts on the Meriweather structure in Sections 5, 8, 16, and 17-33n-9w, which were bid in by Dan Drumheller for 15 cents an acre, and 639 acres on the Hagan structure in Sections 2 and 3-31-7w, bid in by W. M. Fulton for 15 cents an acre. C. Emboy bid 5 cents an acre on 318 acres in Sections 16 and 17-31-5, where R. C. Tarrant is starting a wildcat.

The Superior Oil Co. of California is beginning a deep test to the Tensleep horizon at 9,400 ft. on the Bunker Hill structure in Carbon County, Wyoming, in its 1 Brimmer. The dome is 2½ miles northeast of the prolific Wertz field operated by the Sinclair-Wyoming Oil Co. The field has been proven for gas in three wells in the Shannon sand at around 1,400 ft. The new test is ½ mile southeast of a test drilled in 1932 which found water in the Sundance at 6,748-91 ft., the lowest horizon tested on the structure, but which carried gas in the Shannon, show of gas in the Frontier, and oil saturation in the Muddy, and water in the Lakota and Morrison.

Sinclair-Wyoming 1 Mary Carter, a wildcat on the Sherrard dome, is showing up favorably with 6,000,000 cu. ft. of gas in the Lakota sand topped at 2,955 ft. in a drill-stem test. It also had a show for 1,000,000 cu. ft. in the Frontier at 1,752-1,810 ft. It is headed for the Tensleep.

SUMMARY OF COMPLETIONS

Colorado

	No.	Bbl.	Footage
Gas wells: Fields	1	*9.9	2,876

Wyoming

	No.	Bbl.	Footage
Dry: Wildcats	1	.....	4,803

Montana

	No.	Bbl.	Footage
Oil wells: Fields	2	345	5,878
Gas wells: Fields	1	*0.5	2,705
Total	3	.....	6,583

*Million cu. ft.

COLORADO COMPLETIONS

East Hiawatha field, Moffat County: Mountain Fuel Supply 9 Florence Wilson, NE SE NE 22-12n-100w T.D. 2,876 ft., P.B. to 2,859 ft., 7-in. 2,868 ft., 10,942,000 cu. ft. gas, 1,078 lb. R.P., from Wasatch sands at 2,036-61 ft., 2,252-97 ft., 2,764-87 ft., and 2,805-40 ft., through perf. casing.

COLORADO DRILLING REPORT

Archuleta County: Navajo Oil Co. 1 Brooks, NE NE NW 2-32n-2e, spudded in 12½-in. hole, cable tools, to go to Dakota at around 1,100 ft., S.D., to complete rigging.

Huerfano County: Rheyn & Tomkins 1 Two Pines, SE SE 31-28s-69w, T.D. 1,500 ft., waiting on casing.

S. W. Pressey 3 Alamo, SW SW NW 10-27s-68w, drilling 1,510 ft.

Kiowa County: Stanolind 1 Snell, C SW SW 7-20s-41w, drilling 840 ft.

La Plata County: E. B. Klem 1 Olbert, NW SW 9-35n-12w, T.D. 4,290 ft., fishing tools.

Nick Splatter 1-X Bryce, C SW SW 31-33n-9w, T.D. 4,450 ft., drilling by tools at 4,150 ft.

Las Animas County: Barney Oil 1 Dutto-Marchisio, NW NW 32-33s-62w, T.D. 1,610 ft., waiting on fishing tools.

Logan County: Mutual Oil 1 State, C SW SW 32-7n-51w, T.D. 4,840 ft., P.B. to sand at 4,480-96 ft., bailing and testing, probably will abandon.

Moffat County: Texas 13 Knowlton, NW NW NW 10-4n-91w, drilling 4,687 ft.

Privett & Spangler 1 Stillings, NE SE SE 12 5n-96w, drilling 1,965 ft.

Great Divide Petroleum 1 Wyatt, NW NW SE 6-9n-92w, S.D. 1,887 ft.

C. R. Privett 1 Sutton, NE NE SW 1-5n-96w, T.D. 2,420 ft., straightening hole at 2,346 ft.

Mountain Fuel Supply 10 Wilson NW SW NW 23-12n-100w, location, first report.

Stanolind 19-M Parkinson, NW SW NE 22-4n-92, T.D. 3,540 ft., cleaning out at 3,536 ft.

Stanolind 11-X Parkinson, CWL NE SE 22-4n-92w, drilling 2,011 ft. in shale.

Rio Blanco County: Texas-California 8 Unit, NW SE NW 26-3n-9w, 2,800 ft.

United Oil Producers 1 Hill, Lot 13, 6-1n-101w, S.D. 1,300 ft.

Desert Oil Co. 1 Rector, Lot 6, 35-2n-102w, spudded.

United Producers 2 Hill, CEL Lot 13, 6-1n-101w, drilling 550 ft., shale.

Buford Oil Co. 1 Government, C SW SW 16-1n-91w, T.D. 4,527 ft., running tubing with packer to acidize and test.

Routt County: Elk River Co. 1 Fred N. May, C SE SE 34-8n-86w, drilling 450 ft.

WYOMING COMPLETION

Elk Mountain district, Carbon County: Ohio 1 Union Pacific, NE NE NE 33-20n-81w, T.D. 4,803 ft., plugging to abandon, water in Sundance, top 4,763 ft., elev. 7,953 ft.; tops: Muddy, 4,120 ft.; Dakota, 4,221 ft.; Lakota, 4,324 ft.; Morrison, 4,340 ft.

WYOMING DRILLING REPORT

Carbon County: Continental Oil 1 Frank M. Johnson, SE SE SW 1-24n-88w, drilling 3,223 ft. in lime and shells, top Morrison 3,009 ft.

Sinclair-Wyoming 27-A Wertz, CSL NW SW 6-26n-89w, drilling 3,600 ft.

Sinclair-Wyoming 26-A Wertz, NW SE SE 1-26n-90w (Sweetwater County), drilling 4,841 ft.

Sinclair-Wyoming 1 Mary Carter, NE SE SE 31-25n-88w, drilling 3,425 ft., 6,000,000 cu. ft. gas in Lakota, top 2,958 ft.

Sinclair-Wyoming 5-F Mahoney, C NE NW 34-26n-88w, T.D. 4,536 ft., preparing to shoot Tensleep.

Glen Swartout 3 Union Pacific, NE NE SE 21-22n-78w, drilling 940 ft., showing for gas well.

Sinclair-Wyoming 25-A Wertz, NW SE SW 6-26n-89w, drilling 5,261 ft.

Sinclair-Wyoming 25-C East Ferris, SE SE NW 25-26n-87w, T.D. 3,994 ft., P.B. second time to set whipstock.

Superior Oil 1 Brimmer, CWL NW NE 32-27n-89w, building rig to go to Tensleep at 9,400 ft., first report, Bunker Hill district.

Ohio Oil 2 Brimmer, SE NW NE 32-27n-89w, cemented 8⅝-in. 83 ft., first report, Bunker Hill field.

Converse County: Harry Free et al 1 Flora K. Jeffrys, NW NW NW 35-32n-69w, contract to Garetson-Knively Co. for series of test holes to determine fault closure preliminary to testing Shannon sand, first report, Shawnee district.

Fremont County: Kirk Oil 6 Tribal, CNL NW SW 23-6n-2w, drilling 1,573 ft.

Indian Oil 4 Tribal, SW NW NW 23-6n-2w, moving in.

Superior Oil Co. 1 Tribal, SW SE SW 15-3n-1w, drilling 300 ft.

Continental 4 Shoshone Indian, CWL SE NE 1-6n-3w, moving in material, first report, Circle Ridge field, west offset to 3 Shoshone, 191 bbl. in Tensleep at 660 ft., T.D.

Natrona County: Casper Creek Oil 1 State, SW SW NW 36-36n-81w, T.D. 2,640 ft., fishing.

Iba Dev. Co. 1, C NE SE 25-32n-82w, drilling 1,825 ft.

General Petroleum 57-16-S, NW SW NE 16-35n-77w drilling in below 4,400 ft.

K. S. Albert 1 Young, NE SE 25-32n-82w, T.D. 1,630 ft., cemented 5⅛-in. 1,590 ft., show oil.

General Petroleum 3-21-G, NW SW NW 21-35n-77w, rigging.

Niobrara County: J. L. Berggren 1 fee, SE NW 23-35n-63w, drilling 2,780 ft.

Cow Gulch Oil 1 Nelson, C SE SW 19-35n-65w, drilling below 5,232 ft., core in basal Sundance at 5,185-5,232 ft. showed oil saturation, on drill-stem test showed trace of oil and mud.

Park County: Yale Petroleum 2-B Frisby, NE NE SE 32-52n-100w, T.D. 3,384 ft., installing pump.

Husky Refining 4-A Rosseau, NW SE SW 33-51n-100w, T.D. 3,702 ft., 8⅝-in. 3,676 ft., testing, swabbed and flowed 825 bbl. in 24 hr.

Stanolind 11-X Rosenberg, SE NE NE 26-58n-98w, T.D. 3,146 ft., top Embar 2,997 ft., Tensleep 3,050 ft., swabbed 6 bbl. per hr., installing pump.

MacKinnie Oil & Drilling 1 Northern Pacific, CNL NW NW 5-57n-99w, S.D. 2,460 ft. for orders.

Enalpac O. & G. 1 Custer, NE NE SW 32-52n-100w T.D. 3,465 ft., cemented 5½-in. 3,299 ft.

Yale Petroleum 2-A Mattie, SW SW NW 33-51n-100w, drilling 3,466 ft.

Yale Petroleum 3-A Frisby, NE SW NE 32-52n-100w location.

Continental 2 Northern Pacific-2, NW SW NE 23-58n-98w, drilling 2,780 ft. in shale.

Yale Oil Corp. 1 Government, NW SE SW 9-57n-98w, location, test to Wall Creek, Big Pole Cat dome.

Continental 5 Northern Pacific-1, NW SE SE 23-58n-98w, rig, waiting on equipment.

Sublette County: Texas 2-I Government, SE NW SW 27-27n-113w, T.D. 1,065 ft., P.B. to 1,055 ft., testing.

Sweetwater County: Sinclair-Wyoming 8 Hughes, SW SW SW 2-26n-90w, drilling 3,881 ft.

Vermilion Oil 1 Government, SW NE NE 6-21n-99w, T.D. 2,280 ft., fishing.

Sinclair-Wyoming 102 Lost Soldier, SE SE SE 3-26n-90w, drilling 4,213 ft. in Tensleep, top 3,968 ft., 7-in. 3,960 ft.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: A. B. Cobb 1 Tribal-206, NW NW SW 19-32n-5w, T.D. 2,962 ft., 7-in. 2,916 ft., show oil in Sunburst 2,875-95 ft., Cut Bank sand 2,905-55 ft., main pay 2,945-55 ft., swabbed 245 bbl. first 24 hr.

R. C. Tarrant 3 Larson, C E½ NW 7-34n-5w, T.D. 2,705 ft., 6¼-in. 2,645 ft., 80 ft. 4¾-in. liner set on bottom, Cut Bank sand 2,675-2,702 ft., est. 500,000 cu. ft. gas, open flow.

A. P. Consolidated 6 Keisel, CNL NW 11-34n-6w, T.D. 2,916 ft., 7-in. 2,847 ft., Sunburst 2,796-2,808 ft., show oil at 2,825-39 ft., Cut Bank 2,842-2,910 ft.; main pay 2,885-2,910 ft., 2,000 ft. oil in hole, swabbing, est. 100 bbl.

MONTANA DRILLING REPORT

Fallon County: Carter 1 Northern Pacific, C SE SW 19-4n-62e, T.D. 9,678 ft. in schist at 9,654 ft., cemented 7-in. at 8,822 ft., test through perf. at 8,400-8,644 ft., showed water, recementing with 300 sacks, will perf. at 6,800-8,300 ft. and test.

Mondakota Dev. Co. 3, C NE NE 36-5n-60e, drilling 500 ft. in Pierre shale.

Glacier County: Glacier Prod. 4 Rigney, SW SW NW 2-35n-6w, T.D. 2,970 ft., bailing rotary mud to test.

Par Oil 2 Tribal-204, NE NW SE 13-32n-6w, drilling 625 ft., top Colorado 600 ft., 10¾-in. 610 ft.

William Hanlon 3 Tribal-196, SW NW NE 30-32n-5w, rig.

Indian Oil 2 fee, C NW SW 4-34n-6w, drilling 950 ft., top Colorado 663 ft., 10¾-in. 690 ft.

Glacier Production 5 Corrigeux, C SW NW 28-33n-5w, drilling 1,260 ft., top Colorado 695 ft., 10¾-in. 725 ft.

R. C. Jeffries 2 Tribal-197, SW SW NW 30-32n-5w, drilling 1,325 ft., top Colorado 610 ft., 10¾-in. 640 ft.

Glacier Production 1 Bailey, C NE SW 7-33n-5w, drilling 785 ft., top Colorado 560 ft., 10¾-in. 585 ft.

Texas 4-B Government, C SW SW 17-32n-5w, rig.

Texas-Miller 1 Morgan, 660 ft. S NE cor. 32-33n-5w, rig.

Lawler-Hoer 2 Clarkson, SW SW SW 9-33n-5w, rig on ground.

Santa Rita 7 Rasmussen, CEL NW SW 33-33n-5w drilling 915 ft., top Colorado 580 ft., 10¾-in. 606 ft.

R. C. Tarrant 1 Lenoir, SW SW NW 17-31n-5w, rig.

Consolidated Gas 3 Tribal-172, SW NW NW 18-32n-5w, spudded, first report.

Santa Rita 15 Tribal, SW SE NE 3-35n-6w, rig, first report.

A. B. Cobb 2 Tribal-206, SW NW SW 19-32n-5w, rig, first report.

Cobb, Jeffries, Texas 1 fee, NE NE SE 3-35n-6w rig, first report.

Hill County: Edwards & Callison 1 Hanson, SW SE NW 25-33n-15e, drilling 1,474 ft. in wet hole, unable to shut off water at 1,100 ft.

Toole County: Montana-Dakota Utilities 327 Donovan, C NW SE 31-34n-1w, drilling 925 ft., 10-in. 220 ft.

Hat Oil 1 Mitchell, C NE SW 24-37n-3w, standing 1,315 ft.

E. O. Reickhoff 1 Reickhoff, C NE SW 3-32n-2w, standing 60 ft.

J. H. Agen 18 Goeddertz, CSL NE SW 23-35n-3w, rigging.

Harmon & Morton 1 Sohn, SW SW NE 23-35n-3w, spudded to 60 ft. and S.D.

Nepstad Oil 3 Hugi, C SE NW 11-35n-3w, rig.

Casper T. Oien 12 Engermoen, NE SE NW 14-35n-2w, T.D. 1,570 ft., 170 ft. oil in hole, standing.

A. A. Oil Co. 1 Fey, SW SE SE 32-37n-2e, drilling 1,010 ft. (cor.).

(Continued on Page 86)

NORTH CENTRAL TEXAS

Tests in Five Counties Show Oil; Two May Open Pools

By D. H. STORMONT

WICHITA FALLS, Tex., Nov. 17.—Five wildcats in as many counties in the North Texas district this week reported the indication of possible oil production. Subsequent testing, however, did not in all cases bear out earlier expectations.

Of the five wildcats, the most promising test is the Bruce Sullivan 1 McCoy in the J. M. Seaton Survey, 4 miles south of Crowell in Foard County. Saturated conglomerate was logged from 5,593-5,610 ft. and, on a 20-minute drill-stem test, 1 McCoy returned 5 ft. of oil, 30 ft. of oil-cut mud and 90 ft. of drilling water. At the end of the week operator was drilling below 5,902 ft. on a 6,000-ft. contract, which will be fulfilled before any completion attempts are made.

In Montague County, Continental 1 Winder is swabbing salt water showing small amounts of oil and gas from the Mississippi lime at 6,610 ft., total depth. Previously, operator had set 5-in. casing on top of the lime section at 6,508 ft.

SUMMARY OF COMPLETIONS

North Texas

	No.	Bbl.	Footage
Oil wells: Hull Silk	2	322	5,377
K.M.A.	2	1,008	8,469
Nocona	2	18	1,850
Other fields	15	2,988	33,124
Wildcats	3	924	8,873
Dry holes: Miscellaneous pools	8	.....	12,578
Wildcats	1	.....	965
Total	33	.....	71,236

West Central Texas

	No.	Bbl.	Footage
Oil wells: Fields	4	417	9,021
Wildcats	1	3	262
Gas wells: Fields	1	*5.0	3,680
Wildcats	1	*1.0	1,515
Dry holes: Fields	1	.....	1,580
Wildcats	10	.....	18,400
Total	18	.....	34,508

*Million cu. ft.

Since commercial oil production from the Mississippi is unlikely, operator is expected to plug back to the Bend series. In drilling, 1 Winder showed for a commercial producer and a new field discovery in the Nocona lime at 6,235-58 ft. Location is in Section 4, Limestone C.S.L. Survey, 1 mile east of the town of Stoneburg.

Operator is cleaning out Tom F. Hunter 1 Robertson, Baylor County wildcat, 16 miles east of Seymour in the Robertson C.S.L. Survey, to continue testing. No. 1 Robertson has been deepened from 3,014 ft. to 3,021 ft. and, during the week, bailed ¼ bbl. of oil and 1 bbl. of water per hour.

Early in the week, Kerlyn Oil Co.-Phillips 1 Garvey aroused the interest of operators in the Farmer area of Young County by drilling oil-stained lime from 5,231-37 ft. and then coring from 5,237-52 ft. with returns showing 3 ft. of lime with oil odor. However, a 30-minute drill-stem test of the section from 5,234-52 ft. recovered 3,600 ft. of salt water and 120 ft. of drilling mud but no oil. No. 1 Garvey is drilling ahead below 5,265 ft. Location is in Section 4, G.&N.B. Survey.

In Archer County, Dr. K. Van Allen 1 Kelley, J. W. Cain Survey, 5½ miles west of Archer City, has topped the Mississippi lime at 5,149 ft. and is drilling in lime stained with oil at 5,155 ft. Meanwhile, Phillips 1 Pendery, Section 13, Block 4, H.&T.C. Survey, continues to drill after recovering only 330 ft. of drilling mud on a 20-minute drill-stem test from 5,960-6,046 ft.

Jack County Discovery Gaged

Jack County's newest discovery, Taubert & McKee 1 Hoefle, A. James Survey, Abstract 318, in the northwestern part of the county, has been officially gaged. The well rated an estimated daily potential of 900 bbl. by flowing 303 bbl. in 3 hours through ¾-in. choke on tubing. Production is from 4,817-35 ft. in the Caddo lime, topped at 4,798 ft.

A south offset to the new discovery well is being rigged up at B-1 Hoefle by Hanlon-Buchanan, Inc. This test will be the first operation for the new pool and the first of five staked in the area by Hanlon-Buchanan 2 weeks ago. No. B-1 Hoefle is in the A. James Survey.

Five Wildcats Staked; Three In Throckmorton County

Five new wildcat tests were announced for this district during the week and three of them were staked in Throckmorton County. In the shallow Howsley-McCord area of southern Throckmorton County, Jones & Stasney and Groover & Rose have made location for 2 C. T. Brockman in the Comanche Indian Survey 94. No. 2 Brockman is ¼ mile east of a dry hole drilled 2 years ago, which logged shows in the Mississippi lime. The wildcat is contracted to 4,700 ft. to test the Mississippi as well as the Caddo lime, expected around 4,200 ft.

In addition to 2 Brockman, two shallow wildcat tests were staked in the county. Rudman & Bell announced location of 1 Joe B. Matthews on a 40-acre lease in Section 21, C.I.R. Survey. The wildcat is scheduled to 1,000 ft. In the L. Miers Survey, F. E. Butler staked 1 E. S. Cook on a 40-acre tract. Contract depth was not announced.

A 5,250-ft. Ellenburger lime wildcat test is getting under way in Archer County, 2½ miles northeast of Olney. The wildcat is Golding & Cochran 1 Kundel, B.B.B.&C. Survey.

In Cooke County, Frank and Fred Jones are moving back rig to 1 Fette in preparation to deepen from 1,154 ft. to the Ellenburger lime.

NORTH TEXAS COMPLETIONS

Wildcats

Clay County: L. T. Burns 1 A. S. Hodges, Sec. 64, J. H. Belcher Sur., 20 bbl. in 24 hr., pumping, pay 3,928-38 ft.

Jack County: Taubert & McKee 1 Mary Hoefle, A. James Sur. A-318, 303 bbl. in 3 hr., ¾-in. choke, est. 900 bbl., top Caddo 4,798 ft., pay 4,817-35 ft.

Wichita County: Paul H. Sisk 1 Lola Ann Sisk, Sec. 15, Lge. 2, Denton C.S.L. Sur. A-57, 4 bbl. in 24 hr., pay 98-100 ft.

Young County: Amerada 1 J. W. Dows, 1,117 ft. from E and 783 ft. from NW cor. of Sec. 750, T.E.&L. Sur., dry at 965 ft.

Fields

Antelope, Clay County: Shell 13 A. Coburn, Sec. 2605, T.E.&L. Sur., 87 bbl. in 8 hr., est. 175 bbl., pay 3,172-3,220 ft.

Hull Silk, Archer County: R. C. Libscomb 7 L. F. Wilson, Sec. 25, Lot 13, A.T.N.C. Sur., 32 bbl. in 1 hr., est. 225 bbl., pay 3,820-50 ft.

Henry Grace 2-B L. F. Wilson, Sec. 1, Blk. 87, A.T. N.C. Sur., 97 bbl. in 24 hr., pumping, pay 1,523-27 ft.

K.M.A., Wichita County: Hammon, Hanlon-Buchanan, Inc. 47 Fassett & Tuttle, Sec. 1, T.E. Sur. A-76, 67 bbl. in 3 hr., ¾-in. choke, 120-qt. shot 3,960-86 ft., top K.M.A. 3,798 ft., pay 3,964-88 ft.

Shell and Phillips 39 N. C. Griffin, F. Jordan Sur. A-167, 170 bbl. in 3 hr., est. 750 bbl., top K.M.A. 3,820 ft., pay 4,456-81 ft.

Nocona, Montague County: Jack Story Jr. 3 M. H. Salmon, Samuel Little Sur. A-417, 15 bbl. in 24 hr., pumping, pay 885-902 ft., P.B. from 937 ft.

Pure Oil Co. 6 J. E. Crow, John Chambliss Sur. A-123, 3 bbl. oil and 4 bbl. water in 24 hr., pumping, 50-qt. shot 898-909 ft., T.D. 913 ft.

T.C.U., Cooke County: E. W. Mudge Jr. 8 C. J. Fette, Charles Carter Sur. A-1190, 10 bbl. in 24 hr., pumping, pay 1,124-36 ft.

Voth, Cooke County: High Point Oil Co. 7 C. J. Fette, J. L. Townley Sur., 17 bbl. in 24 hr., pumping, pay 1,119-34 ft.

Miscellaneous Fields

Archer County: C. T. Robertson 1 J. E. Birdwell, Sec. 2418, T.E.&L. Sur., dry at 1,400 ft.

Deep Oil Dev. Co. 4-A E. P. Griffin, Sec. 13, Palo Pinto C.S.L. Sur. A-339, 78 bbl. in 24 hr., pumping, pay 1,610-25 ft.

Baylor County: Paul B. Scott 2 Fayette C.S.L., Fayette C.S.L. Sur. A-148, 6 bbl. oil and 24 bbl. water in 24 hr., pumping, pay 3,017-26 ft.

Clay County: Marvin Hudson 1 C. T. Taylor, Sec. 40, Bacon's subdiv., dry at 1,158 ft.

Johnson & Kouri 3-E C. T. Taylor, Sec. 40, Bacon's subdiv., 45 bbl. in 24 hr., pumping, pay 1,117-32 ft.

Perkins & Cullum 2-B C. T. Taylor, Sec. 42, Bacon's subdiv., dry at 1,046 ft.

Birdwell Oil Co. 1 P. Roop, Sec. 10, Thornberry subdiv., dry at 1,305 ft.

Harper & Knappenberger 6 Paul Bilbrey, Sec. 3, W. Wyatt subdiv., 18 bbl. in 6 hr., pumping, est. 58 bbl., pay 1,149-59 ft., T.D. 1,175 ft.

C. F. Chram 6-A Dolph Summers, Sec. 1-2, W. Wyatt subdiv. A-431, dry at 1,178 ft.

Continental, Superior and Dillard 6 Ross Bros., Sec. 31, Wm. Walker Sur. A-703, 178 bbl. in 6 hr., ¾-in. choke, est. 500 bbl., 8,000 gal. acid 5,366-5,404 ft., T.D. 5,445 ft., old well drilled deeper.

Cooke County: Magnolia 16 Ramsey est., C. Furinash Sur. A-369, dry at 4,854 ft.

Trumter Pet. Co. 1-B Andress Bros., J. Clark Sur. A-194, completed as key well, T.D. 765 ft.

Montague County: Lesh & McCall 4 Cora L. Davenport, J. Fitch Sur., 40 bbl. in 3 hr., ½-in. choke, est. 150 bbl., pay 2,491-2,501 ft., old well drilled deeper.

Doss Drilling Co. 2 First Natl. Bank of St. Jo, J. L. Graham Sur. A-295, 190 bbl. in 3 hr., 20/64-in. choke, est. 800 bbl., pay 3,626-3,712 ft.

Throckmorton County: Cross & Peterson 3 Harrell, B. Stroud Sur. A-1282, dry at 673 ft.

Wichita County: Perry Browning 5 C. J. Simpson, Blk. 33, K.W.V.F. Sur., 60 bbl. in 24 hr., pumping, pay 1,766-70 ft.

Perry Browning 7 C. J. Simpson, Sec. 33, K.W.V.F. Sur., 15 bbl. in 24 hr., pumping, pay 967-70 ft.

R-G Drilling Co. 4 W. L. Warren, Sec. 32, K.W.V.F. Sur., 65 bbl. in 24 hr., pumping, pay 1,760-70 ft.

Wolf & Hull 8 Daume, Sec. 1, S.P. Sur. A-429, 9 bbl. in 24 hr., pumping, pay 694-96 ft.

Young County: W. F. Palmer 7-D R. Campbell, Sec. 1484, T.E.&L. Sur., dry at 964 ft.

Peno Oil Co. 10 G. M. Boren, R. Newman Sur. A-2110, completed as key well, no test, T.D. 1,073 ft.

Tex-tor Oil Corp. and McLester 5 Lillie Moseley, Sec. 113, B. G. Moseley Sur. A-2220, 831 bbl. in 18 hr., est. 1,000 bbl., pay 3,778-3,812 ft.

NORTH TEXAS ACTIVE WILDCATS

Archer County: Phillips 1 Reilley, "Pendery," SW NW Sec. 13, Blk. 4, H.&T.C. Sur., drilling ahead after making D.S. test 5,598-5,698 ft., open 30 min. recovered 90 ft. drilling mud.

Dr. K. Van Allen 1 E. C. Kelley, 330 ft. from N and E lines Sec. 68, Harris subdiv. of Club ranch, 5,000-ft. test, top Caddo 4,935 ft., drilling 4,995 ft.

Baylor County: Tom F. Hunter 1 Robertson C.S.L., 4,590 ft. from N and 460 ft. from E lines Robertson C.S.L. Sur. A-280, 3,500-ft. test, top lime 3,011 ft., made steel-line measurement, waiting on cement.

Clay County: Continental 1 Spring, 200 ft. from N and 1,254 ft. from W lines Sec. 24, M. True Sur. A-1005, 6,500-ft. rotary test, drilling 2,210 ft.

Shell 1-A J. W. Maddox, 2,272 ft. from N and 2,114 ft. from W lines Hughes Sur. A-179, 5,600-ft. rotary test, D.S. test, no shows, top Caddo 5,448 ft., preparing to drill ahead.

Shell 1 B. Williams, 330 ft. from N and W lines E 60-ac. Sec. 63, J. H. Belcher Sur., 6,500-ft. rotary test, drilling 4,832 ft.

Superior Oil Co. 1 G. W. Scaling, 2,600 ft. from N and 1,200 ft. from W lines Sec. 2, H.T.&B. Sur. A-882, 6,000-ft. rotary test, moving in material.

Cooke County: Saulsbury Oil Co. 1 W. D. Rowland, 330 ft. from S and 547 ft. from W lines of NW cor. L. B. Ladlock Sur. A-1027, 2,500-ft. rotary test, coring 2,275 ft.

Bill Russell 1 Powers, 300 ft. from N and W lines Powers tract, Hall Sur. A-790, 1,304 ft., moving in spudder.

Denton County: Hunt Oil Co. 1 T. J. Jones, 4,300 ft. from S and 671 ft. from E lines J. Thomas Sur. A-1239, Ellenburger test, drilling 3,450 ft.

Foard County: Bruce Sullivan 1 McCoy, 1,980 ft. from W and 467 ft. from N lines J. M. Seaton Sur., 6,000-ft. rotary test, D.S. test 5,610 ft., preparing to drill ahead.

Jack County: J. M. Robinson 1 John J. Power, 511 ft. from E and 1,480 ft. from S lines of W/2 of M. Hunt Sur. A-298, 425-ft. cable-tool test, first report.

Alma Oil 1 Maxey, V. W. Maxey Sur., Sec. 2, P.B. 5,425 ft. from 5,665 ft., 5,000 gal. acid, swabbing oil load and acid water.

Magnolia 1 Borden, 1,000 ft. from N and 500 ft. from W lines W. R. Smith Sur. A-547, Ellenburger test, fishing drill pipe 6,595 ft.

O. J. Perrin 1 Brumbelow, 1,045 ft. from S and 720 ft. from E lines H. C. Ayers Sur. A-4, drilled plug 5,935 ft., bailed dry, stood 12 hr. and had no shows.

Montague County: Benson Bros. 1 Riley, 467 ft. from S and midway between E and W lines of farm, C. Ellis Sur. A-1146, 7,500-ft. rotary test, drilling 6,916 ft.

J. A. Chapman 1 Fowler, 330 ft. from S and E lines J. W. Massie Sur. A-463, flowed oil and died, cleaning out, T.D. 6,008 ft.

Continental 1 Winder, 467 ft. from N and E lines S/40 of W/80 of N½ of Sec. 4, Limestone C.S.L. Sur., 7,200-ft. rotary test, 7-in. casing, 6,610 ft., waiting on cement.

Youngblood, Foree & Stogner 1 C. D. Meador, 467 ft. from SE and SW lines J. B. Miller Sur. A-461, 6,000-ft. rotary test, drilling 3,235 ft.

Wise County: Hunt Oil Co. 1 W. H. Halman, 700 ft. from N of road and 1,000 ft. from W of railroad, G. W. Cash Sur. A-166, 6,000-ft. rotary test, rigging up.

Young County: Kerlyn Oil and Phillips 1 E. C. Garvey, 947 ft. from N and 2,353 ft. from E lines Sec. 4, O.B.&N. Sur. A-19, 5,700-ft. rotary test, drilling 4,700 ft.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Nov. 17.—Activity in the West Central Texas district showed a sudden decline this

week and for the first time in several months not one new wildcat operation was reported. Two wildcats, both previously reported, are continuing to test in an effort to find oil production.

During the week, Edward C. Lawson set casing at 2,872 ft. at 1 C. C. Rose, prospective Haskell County pool opener 7 miles east of the town of Haskell in the J. M. Cass Survey. When operator drilled plug the hole filled with considerable salt water. The source of the water is believed to be higher up in the hole and at the end of the week operator was running liner to test at 2,985 ft., total depth.

In Concho County, Floyd C. Dodson 1 Robert Wilson will be given a second acid treatment. The discovery well was given a 2,000-gal. acid treatment late in October and since then has been pumping 2 bbl. of oil per hour, with small amounts of fresh water. No. 1 Wilson was drilled to 4,094 ft. and then plugged back to 3,748 ft. The well will be acidized the second time with 3,000 gal. in an attempt to bring it in from plugged-back depth. Location is 425 ft. from the south and 1,250 ft. from the west lines of the Thomas Green Survey 1.

Record Completion Indicated In New Coleman County Pool

The new Silver Valley pool of northwestern Coleman County is in line for its seventh oil producer and probably its largest. During the week operators at States Oil Corp. 1-B W. L. White filed reports with the Railroad Commission estimating a daily potential of 800 bbl. of oil for the well.

No. 1-B White cored oil sand from 3,558-3,606 ft. and after a sandy shale break, again from 3,610-23 ft., total depth. Gas volume tested 1,350,000 cu. ft. daily. The test is located in Section 21, T.&N.O. Survey.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Brown County, semiwildcat: D. C. Snellers 1 Irene Smith, T. S. Thom Sur. 53, 1,000,000 cu. ft. gas, 5,000 gal. acid 1,501-15 ft.

Callahan County: Ungren & Frazier 2 Ethel Burks, Sec. 116, B.B.B.&C. Sur., dry at 1,115 ft.

Marbert Oil Co. 1 T. E. Haydon, 450 ft. from S and W lines of SE/4 Sec. 115, University Land Sur., dry at 654 ft.

N. D. Hust 1 J. M. Isenhower, 450 ft. from N and 150 ft. from E lines Sec. 2274, T.E.&L. Sur., 3 bbl. in 24 hr., pumping, pay 257-62 ft.

J. W. Hooser 1 J. M. Isenhower, 1,350 ft. from E and 150 ft. from N lines Sec. 2978, T.E.&L. Sur., dry at 538 ft.

Yates & Brownfield 1 W. J. Carpenter, 1,750 ft. from W and 150 ft. from S lines, Walter Converse Sur. 333, dry at 392 ft.

Coleman County: States Oil Corp. 1 T. J. Hudson, Sec. 74, G.H.&H. Sur., Blk. 2, dry at 3,890 ft.

C. C. Collier 1 W. L. Stafford, Bunita Alderata Sur. 275, dry at 900 ft.

Jones County: Roeser & Pendleton 1 C. H. Moore, Sec. 33, Blk. 15, T.&P. Sur., dry at 2,367 ft.

Shackelford County: Ungren & Frazier and Rhodes Drilling Co. 1 E. O. Beck, Sec. 163, B.B.B.&C. Sur., dry at 1,670 ft.

Stonewall County: Shell 1-A J. D. Patterson, Sec. 357, Blk. D, H.&T.C. Sur., dry at 3,827 ft.

Taylor County: Ungren & Frazier 1 Trinity University, Lot 2, Grimes C.S.L. Sur. 148, dry at 3,047 ft.

Fields

Cisco, Eastland County: Hickok Prod. & Dev. Co. 4 Wright & Harrell, J. B. Haxie Sur. 75, 5,000,000 cu. ft. gas, 2,000 gal. acid 3,660-80 ft.

Cook, Shackelford County: Roeser & Pendleton, Inc. and Continental 6-A-117 W. I. Cook, Sec. 117, E.T. Sur., 99 bbl. in 24 hr., pumping, pay 1,694-1,703 ft.

Novice, Callahan County: States Oil Corp. 12 J. P. Morris, Sec. 176, Blk. 2, G.H.&H. Sur., 72 bbl. in 24 hr., 30-qt. shot 3,549-84 ft., T.D. 3,589 ft.

Shackelford, Shackelford County: J. F. Baker 6 M. Davis, Sec. 17, Blk. 14, T.&P. Sur., 90 bbl. in 24 hr., 20-qt. shot 1,537-43 ft., T.D. 1,549 ft.

Triplett, Jones County: T. D. Humphrey 5 M. V. Triplett, John J. Hughes Sur. 256, dry at 1,580 ft., lost hole.

Wimberly, Jones County: H. Hines 2 A. M. Wimberly, Lot 87, Goodwin subdiv. of De Witt C.S.L. Sur. 126, 156 bbl. in 9 hr., ¾-in. choke, est. 300 bbl., pay 2,216-30 ft.

WEST CENTRAL TEXAS ACTIVE WILDCATS

Coleman County: R. M. Coleman 1 W. W. Kingsberry, 3,254 ft. from S and 3,305 ft. from E lines Wharton C.S.L. Sur. 496, 2,300-ft. cable-tool test, first report.

Ellis & Estes 1 I. N. Bridges, 467 ft. from S and E lines of Bridges land in E.T. Sur. 107, 3,500-ft. cable-tool test, drilling 40 ft.

McMillan & Rominger 1 Wilkerson, old well being worked over, 1,570 ft. from N and 587 ft. from W lines Sec. 3, Blk. 2, G.H.&H. Sur., T.D. 2,823 ft., shut in 2,823 ft.

Merry Bros. & Perini 1 Greer, 1,283 ft. from S and 467 ft. from W lines Lot 2, H. Kegans Sur. 520, 4,000-ft. rotary test, shut in 3,937 ft.

Comanche County: J. C. Hamer 2 Mary Smith, 660 ft. from N and 1,000 ft. from E lines Sec. 31, B.B.B. &C. Sur. A-76, 1,000-ft. cable-tool test, first report.

C. D. Lane 1 W. T. Hazzard, 3,889 ft. from NW and 1,806 ft. from NE lines Marnaduke Hatton Sur. A-424, 2,900-ft. cable-tool test, drilling 630 ft.

Concho County: Floyd C. Dodson 1 Robert Wilson, Thomas Green Sur., 10 mi. SW Eden, testing 4,102 ft.

C. M. Joiner Leasing Corp. 1 G. R. Armor, 1,315 ft. from S and 330 ft. from W lines Sec. 105, Blk. 72, T.&N.O. Sur., old well drilled deeper, S.D. orders 3,420 ft.

Eastland County: Stewart Oil 1 Shaeffer, 660 ft. from E and 1,980 ft. from S lines 394-ac. farm Moses Allen Sur. 26, 3,500-ft. test, fishing tools 2,762 ft.

Fisher County: P. R. Long 1 Maberry, SE cor. A. A. Scoring Sur., 2 mi. SW of McCaully, testing 3,289 ft.

Shell 1 Vaughn, 467 ft. from N and 1,787 ft. from W lines Sec. 205, Blk. 21-V, H.&T.C. Sur., 7,250-ft. test, bailing, cleaning out, 6,921 ft.

Hamilton County: Grady Wallace 1 J. H. Robertson, 4,750 ft. from NE and 6,400 ft. from SE lines J. Chew Sur., Pat. B-1635, A-164, 4,000-ft. cable-tool test, drilling 1,015 ft.

Haskell County: J. A. Worsham 1 McLennan, 440 ft. from S and W lines 370-ac. farm S. C. Robertson Sur. 4, A-352, 3,500-ft. rotary test, drilling 2,600 ft.

Edward C. Lawson 1 C. C. Rose, 489 ft. from S and 440 ft. from E lines 392-ac. tract J. McCass Sur. 57, A-95, 3,000-ft. test, running casing 2,985 ft.

Jones County: Butler & Horne Drilling Co. 1 G. W. Murfee, 660 ft. from N and W lines SW cor. E. Dickinson Sur. 275, but in Jones Bosten Sur. 276, 3,500-ft. cable-tool test, first report.

Petro-Producers Co. 1 George Walker, 330 ft. from S and W lines Sec. 46, T.&P. Sur., Blk. 16, 2,000-ft. cable-tool test, first report.

J. B. Cunningham 1 J. B. Freeman, 330 ft. from W and 2,000 ft. from S lines Alex. Glenn Sur., 2,800-ft. cable-tool test, drilling 525 ft.

W. L. Snoddy 1 Huddleston, 2,150 ft. from S and 467 ft. from W lines farm in E part Sec. 41, T.&P. Sur., Blk. 18, 3,000-ft. rotary test, drilling 2,500 ft.

Ungren & Frazier 1 S. J. Peyton, 330 ft. from S and 1,070 ft. from E lines 100-ac. tract Stephen M. Hale Sur. 251, drilling 1,867 ft.

Palo Pinto County: Hickok & Reynolds 3 Gauldin, 467 ft. from S and E lines Sec. 1756, T.E.&L. Sur., S.D. orders 5,200 ft.

E. Lloyd 1 C. A. Dalton, 560 ft. from S and 1,165 ft. from E lines W. Lewis Sur. A-299, drilling 1,250 ft., cleaning out.

Parker County: J. L. Higginbotham 1 J. B. Gilbert, 330 ft. from S and E lines of most southerly NW cor. G.W.T.&P. Sur. A-1958, old well drilling deeper, 3,000 gal. acid 4,388 ft., pulling tubing to relieve stuck swab.

Shackelford County: R. H. Roark 1-B Elliott, 660 ft. from S and E lines SW¼ Sec. 9, L.A.L. Sur.,

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Stonewall County: Forest Dev. Oil Corp. 2 C. E. Boyd, 990 ft. from N and 1,700 ft. from W lines Sec. 45, H.&T.C. Sur., Blk. D, SW of No. 1, 5,000-ft. rotary test, rigging up rig.

Stephens County: Denton & Roach 1 Nellie Caraway, 1,170 ft. from E and 2,730 ft. from W lines Sec. 79, T.&P. Sur., Blk. 14, 2,500-ft. cable-tool test, first report.

Daniel & Pardue 1 W. A. Corbett, 440 ft. from S and 940 ft. from W lines 240-ac. lease, Sec. 11, S.P. Sur., 3,350-ft. rotary test, S.D. orders 3,367 ft.

T. S. Schroeder 1 Corbett, 2,200 ft. from E and 444 ft. from N lines Sec. 12, Blk. 3, S.P. Sur., S.D. orders 4,721 ft.

T. G. Shaw, trustee 1 E. Whalen est., 467 ft. from N and W lines Sec. 1089, T.E.&L. Sur. A-370, 4,200-ft. rotary test, S.D. repairs 3,728 ft.

Christie Bros. 1 H. M. Donnell, 2,900 ft. from N and 400 ft. from E lines Sec. 1208, T.E.&L. Sur., old well drilling deeper to 4,000 ft., drilling 3,980 ft.

Taylor County: Butler & Horne Drilling Co. 1 Merchant, 330 ft. from N and 2,687 ft. from W lines S½ Sec. 30, Blk. 16, T.&P. Sur., 2,800-ft. cable-tool test, drilling 1,895 ft.

Permian Basin, Panhandle

(Continued from Page 77)

eastern Yoakum County was reported this week at George P. Livermore 2 Ownby, Section 502, Block D, J. H. Gibson Survey. On official gage the pool extensioner rated a daily potential of 207 bbl. of 30° A.P.I. gravity oil. The gas-oil ratio was 835-1. Final completion attempts were made after 2 Ownby was treated with 2,000 gal. of acid at 5,248-73 ft., total depth.

NORTHERN WEST TEXAS COMPLETIONS

(24-hr. rating based on last 3 hr. of 6-hr. gage)

Fields

Emma, Andrew County: Montecito Corp. 3 Cowden, elev. 3,156 ft., 1,095 bbl., 1-in. choke, pay 4,170-4,278 ft.

Montecito Corp. 7 Cowden, elev. 3,137 ft., 1,374 bbl., 1-in. choke, pay 4,190-4,277 ft.

Sinclair 12 Cowden, elev. 3,146 ft., 948 bbl., 5,000 gal. acid 4,141-4,226 ft.

Seminole, Gaines County: Magnolia and Atlantic 3-189 H.&J., elev. 3,340 ft., 270 bbl., ½-in. choke, 144-qt. shot 5,173-5,245 ft.

Sharon Ridge, Mitchell County: F. W. Merrick 2-A E. T. Strain, elev. 2,243 ft., 220 bbl., pumping, 630-qt. shot 1,624-1,762 ft.

Sharon Ridge, Scurry County: D. & R. Oil 2 O. I. Burney, elev. 2,256 ft., 90 bbl., pumping, 860-qt. shot 2,272-2,461 ft

R. & Y. Oil 2 Bishop, elev. 2,224 ft., 136 bbl., pumping, 940-qt. shot 2,291-2,439 ft.

R. & Y. Oil 1-B Burney, elev. 2,234 ft., dry at 2,455 ft., 780-qt. shot 2,275-2,455 ft., no results.

Slaughter, Cochran County: Atlantic 30 Boyd, elev. 3,659 ft., 1,428 bbl., 2-in. casing outlet, 10,000 gal. acid 4,270-5,063 ft.

Slaughter, Hockley County: Honolulu Oil 8-A Mallett, elev. 3,587 ft., 1,445 bbl., 2-in. casing outlet, 10,000 gal. acid 4,994-5,053 ft.

Honolulu Oil 8-A Slaughter, elev. 3,545 ft., 780 bbl., 2-in. casing outlet, 10,000 gal. acid 4,895-4,990 ft.

Honolulu Oil 24-B Slaughter, elev. 3,540 ft., 1,299 bbl., 2-in. casing outlet, 10,000 gal. acid 4,930-5,024 ft.

Magnolia 3-B Mallett, elev. 3,637 ft., 994 bbl., 3-in. casing outlet, 10,500 gal. acid 4,940-4,995 ft.

Magnolia 12-D Mallett, elev. 3,610 ft., 1,307 bbl., 3-in. casing outlet, 10,500 gal. acid 4,945-5,010 ft.

Magnolia 17-J Mallett, elev. 3,615 ft., 1,197 bbl., 3-in. casing outlet, 10,500 gal. acid 4,945-5,035 ft.

Wasson, Yoakum County: American Liberty Oil 15 Keller, elev 3,633 ft., 190 bbl. oil and 23 per cent water, 10,000 gal. acid 5,000-5,173 ft.

Drilling & Exploration Co. 3-A Randall, elev. 3,667 ft., 120 bbl. oil and 13 per cent water, ½-in. choke, 12,000 gal. acid 4,930-5,100 ft.

Humble 12 Randall, elev. 3,639 ft., 368 bbl., ½-in. choke, 6,000 gal. acid 5,025-5,125 ft.

NORTHERN WEST TEXAS ACTIVE WILDCATS

Andrews County: Furhman 1 M. A. Thornberry, 330 ft. from W and S lines, Sec. 23, Blk. A-42, P.S.L. Sur., 4,600-ft. test, first report.

Fullerton Oil 1 Wilson, C NE SW SE Sec. 15, Blk. A-32, P.S.L. Sur., Ordovician test, drilling 4,500 ft.

Bailey County: Broderick & Calvert 1 G. H. Hayward, 4,167 ft. from W and 1,389 ft. from S lines, Lge. 73, Sutton C.S.L. Sur., 5,500-ft. test, drilling 4,004 ft., tight well.

Borden County: C. E. Hyde 1 Miller-Looney, 330 ft. from N and W lines, Sec. 10, Blk. 33, T.&P. Sur., first report.

Anderson & Prichard 1 Johnson & Clayton, Sec. 1, Blk. 1, John DeShazo Sur., 660 ft. from SW cor., Sec. 23, Blk. 10, E.L.&R.R. Sur., S.D. 4,503 ft.

M. L. Richards 1 W. R. Dunn, SW NE Sec. 307, Blk. 97, H.&T.C. Sur., 3,200-ft. test, drilling 2,865 ft.

Briscoe County: Phillips 1 Montague, NE NE Sec. 6, Blk. B-4, A.B.&M. Sur., preparing to run 9⅝-in. casing 4,900 ft.

Crosby County: George Callihan and C. L. Wagner 1 E. M. Wahlenmaier, 460 ft. from N and E lines, Sec. 3, Blk. D-15, Waxahachie Tap Sur., drilling 4,027 ft.

Dawson County: Ray Albaugh 1 Handley, 1,980 ft. from W and 660 ft. from S lines, Sec. 36, Blk. M, E.L. Sur., 5,250-ft. test, preparing to shoot 4,977 ft.

Gaines County: Amerada 1 Ruth Hudson, Sec. 60, P.S.L. Sur., 660 ft. from N and W lines of section, 7,000-ft. test, moving in material, first report.

Amon G. Carter 4-D Wasson, NW SE Sec. 50, Blk. AX, P.S.L. Sur., testing 11,108 ft.

Likins & Hall 1 Jones, SW NW Sec. 13, Blk. A-7, P.S.L. Sur., 7,200-ft. test, drilling 4,830 ft.

Hockley County: Anderson & Prichard-American Drilling Co. 1 Ellwood, NW NW NW Sec. 15, Blk. A, R. M. Thomason Sur., 5,500-ft. test, drilling 3,590 ft.

Lubbock County: Harrison & Foster 1 Steck, SE SE Sec. 7, Blk. A, John Gibson Sur., 5,500-ft. test, drilling 4,915 ft.

Mitchell County: H. B. Owenby Drlg. 1 Morrison Oil & Royalty, 660 ft. from S and E lines, SE NE Sec. 34, Blk. 29, T.&P. Sur., S.D. 3,120 ft., orders.

Terry County: American Drlg. 1 W. T. Hufnall, 467 ft. from S and E lines, Sec. 14, Blk. D-14, C.&M. Sur., 5,500-ft. test, drill pipe stuck 5,435 ft.

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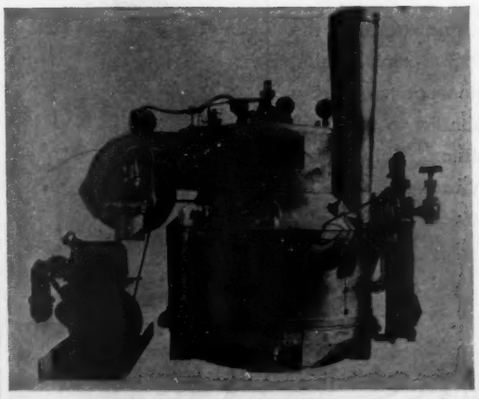

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New Sand Produces in Outpost On Flank of Old Vinton Field

By F. L. SINGLETON

NEW ORLEANS, La., Nov. 17.—A revival of drilling around the flanks of the old Vinton field, Calcasieu Parish, is anticipated following the completion of Union Sulphur Co. 2 Gray, which extended production more than ½ mile southwest and opened production from a new sand. The well was drilled to a total depth of 4,629 ft., and 7-in. casing was cemented at 3,640 ft. after an electrical survey and sidewall cores showed sand with a good oil odor and cut at 3,595-3,624 ft. Casing was perforated at intervals from 3,605-14 ft., and at the close of the week the well flowed 185 bbl. of 25.8-gravity oil through a 12/64-in. choke. Tubing pressure was 320 lb. and casing pressure 450 lb.

Vinton was one of the first oil fields found in the district, and production heretofore had been confined largely to the east and north flanks of the structure. Main production has been from the Miocene sand at an approximate depth of 2,600 ft., and, while not definitely identified, the new sand is believed to be from the Oligocene. The well is located in 4-11s-12w, about 400 ft. northeast of the same company's 1 Gray, abandoned in salt several months ago at a total depth of 5,057 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	9	3,600	77,216
Gas wells: Fields	1	.....	10,996
Dry holes: Fields	7	...	60,914
Total	17	....	149,126

New Sand Found in Bayou State Outpost

The Bayou Sale field, St. Mary Parish, was proven to be one of the district's most important discoveries of the year as Atlantic 1 St. Mary Land Co., 1 mile south of production, was flowing at the estimated rate of 450 bbl. daily through a ¼-in. choke while testing a new sand at 10,310-42 ft. The new sand is in the Miocene, about 220 ft. deeper than the main sand just below 10,100 ft. Midway between this well and the field proper, Humble 1 Davis Luke is reported to be preparing for a production test. This is the fourth producer for the structure which is due to become one of the most active deep fields in the district.

Erath Extended to West

Another extension was scheduled to be marked up for the rapidly expanding Erath field, Vermilion Parish. The well is Phillips 1 Charles Burt ½ mile west of production which is preparing to test after cementing casing on bottom at 11,668 ft. The well is in 20-13s-4e, west of Texas 1 R. S. Henry, completed the previous week to open production from a new and shallower sand at 8,715-45 ft. The majority of the wells drilled on the structure thus far have been drilled to a depth of 11,000 ft. or 12,000 ft., and while two wells are producing pipe-line oil from depths below 11,000 ft., most of the wells have been completed for gas-distillate producers at intervals from 8,700 ft. to depths below 11,000 ft. Numerous sands carrying gas and distillate have been found to overlie the structure, and a recycling plant is to be constructed in the near future.

Second Sand Logged in Hayes Test

On the Hayes prospect, Calcasieu Parish, Gulf Refining continues to drill below 11,072 ft. in 2 Calcasieu National Bank. An electrical survey made during the week showed sand at 10,958-67 ft. Another sand was logged the previous week at 10,373-10,429 ft., which is believed to be the same sand from which Gulf 1 Calcasieu National Bank blew out several months ago. The present well is only 800 ft. east of the abandoned hole.

On the south flank of the Welsh dome, Jefferson Davis Parish, Union Sulphur Co. is reported to be reworking 1 Shields Arceneaux after the well went dead. This well was completed for a good producer several months ago in a new sand at 7,400 ft. The sand is believed to be the Marginulina-Frio sand, several hundred feet deeper than the Miocene sand at approximately 5,600 ft., which was also open during the year. Production from the shallower sand has failed to hold up satisfactorily.

In the Neale field, Beauregard Parish, Atlantic 1 Hawkins unit continues to drill below 11,591 ft. with no shows reported. At this depth the well is several hundred feet deeper than the lower Wilcox pay which produces in two wells at depths below 10,880 ft. In the meantime, a new deep test was being started on the Lilliedoll lease in 26-3s-11w. As production from the upper Wilcox sand at 8,200-8,300 ft. is believed to be limited, future development in the field is expected to be directed toward the lower sand.

LOUISIANA GULF COAST COMPLETIONS

Fields

Bateman Lake, St. Mary Parish: Texas 6 Wax Bayou, 4,750,000 cu. ft. gas, ¼-in. choke, perf. casing 10,252-10,302 ft., T.D. 10,996 ft.

Bayou Blue, Iberville Parish: Union Sulphur 4 Schwing, top salt 6,300 ft., dry, T.D. 6,312 ft. salt.

Belle Isle, St. Mary Parish: Sun 2 State, dry, T.D. 897 ft.

Caillou Island, Terrebonne Parish: Texas 71 State, dry, T.D. 9,350 ft.

Chacahoula, La Fourche Parish: Superior 1 Dibert-Stark & Brown, dry, T.D. 13,004 ft.

West Hackberry, Cameron Parish: Harrison & Abercrombie, 2 Doiron, 675 bbl., ¼-in. choke, perf. casing 7,343-64 ft., T.D. 7,365 ft.

Erath, Vermilion Parish: Texas 1 Henry, 240 bbl., 10/64-in. choke, perf. casing 8,715-45 ft., T.D. 11,599 ft.

Gueydan, Vermilion Parish: Union Sulphur 3 J. B. Baker, dry, T.D. 11,163 ft.

Lake Salvador, St. Charles Parish: Texas 10 State, 423 bbl., ⅛-in. choke, T.D. 10,251 ft., P.B., T.D. 9,725 ft.

Neale, Beauregard Parish: Atlantic 3-B Rice Land & Lumber Co., 357 bbl., ⅛-in. choke, perf. casing 10,998-11,028 ft., T.D. 11,210 ft.

New Iberia, Iberia Parish: Texas 5 Gralino, 420 bbl., 12/64-in. choke, perf. casing 6,210-40 ft., T.D. 6,291 ft.

Paradis, St. Charles Parish: Texas 1 Parite, 432 bbl., ⅛-in. choke, perf. casing 10,120-10,180 ft., T.D. 10,350 ft.

Pine Prairie, Evangeline Parish: C. I. Production Co. 3 Evangeline Land & Mineral Co., 681 bbl., ¼-in. choke, perf. casing 6,238-48 ft., T.D. 8,295 ft.

Richie, Acadia Parish: Bering 2 Ruppert, 145 bbl., 10/64-in. choke, T.D. 3,510 ft.

Stella, Plaquemines Parish: California 162 Delta Mineral Development Co., dry, T.D. 10,079 ft.

West Bay, Plaquemines Parish: Gulf 7-E Buras Levee district, 227 bbl., 5/32-in. choke, perf. casing at 6,836-40 ft., T.D. 7,345 ft.

Woodlawn, Jefferson Davis Parish: Union Sulphur 3 Racca, dry, T.D. 10,109 ft.

Miscellaneous

Acadia Parish: Stanolind 1 Tweedel, 77-7s-3e, drilling shale 9,503 ft.

(Continued on Page 88)

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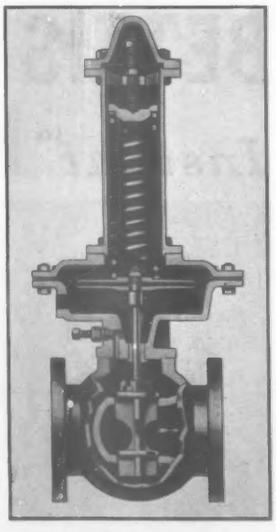

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Good Reed City and Adams Wells; Development Increases

By OTTO C. PRESSPRICH

SAGINAW, Mich., Nov. 17.—Expanding scope of oil and gas development in Michigan continued in the past week as the state Conservation Department granted 34 more drilling permits, continuing the pace of recent weeks in which projected new tests have outnumbered completions.

Sixteen new producing oil wells were completed last week, along with three good-sized gas wells, while seven other tests were discarded as dry holes. The gas wells increased daily potential production by approximately 25,000,000 cu. ft. while the oil potential jumped more than 9,000 bbl. a day with one well in Arenac County's Adams field and two more producers in the Reed City section of Osceola County accounting for two-thirds of the total.

Importance of the Allegan County Hopkins Township field, which has been the scene of considerable new drilling in the past few months, was increased considerably as operators brought in four new wells, without a dry hole for initial yield averaging nearly 250 bbl. per well after acidization. In Van Buren County, also there were four producer completions without a dry hole, but production was smaller and the wells have about the usual water content.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Allegan County	4	970	6,292
Arenac County	1	2,400	2,880
Bay County	2	427	5,844
Clare County	2	938	6,861
Lake County	1	680	3,632
Osceola County	2	3,600	7,093
Van Buren County	4	297	4,907
Gas wells: Clare County	1	*5.7	1,347
Montcalm County	1	*10.5	996
Osceola County	1	*9.5	1,180
Dry holes: Wildcats	7	.....	15,478
Total	26	.....	56,520

*Million cu. ft.

Value of Michigan oil and gas produced reached a peak for the year in September, the state Tax Commission announced. Based on the 2 per cent severance-tax collections, September value at the well was $2,260,000. August valuation was $1,912,000. The September tax levy totaled $45,210.

With several of the week's dry holes being wildcat tests which had been watched with varying degrees of interest, activity in established fields proceeded generally according to routine, except for an approaching Traverse test in Cedar Township, Osceola County. The wildcat was reported to have made a good show of gas and oil at 3,299 ft.

Reports were current that a deep test is to be made in the Grand Rapids area, which subsided rapidly this year after having been developed in 1939-40 into the state's biggest field. Several companies were reported planning a cooperative venture with the possibility of drilling to 5,000 ft. for the first test of St. Peter formation in the Kent-Ottawa county sector. Production in that field now is from the Traverse level between 1,700 and 1,800 ft.

The week's 34 new permits boosted this year's total to 869. Division was: 11 for Osceola County; 6 for Clare; 6 for Missaukee; 3 for Allegan; 3 for Arenac; 1 each for Kent, Isabella, Roscommon, Montcalm, and Van Buren.

MICHIGAN COMPLETIONS

Allegan County

Hopkins Township: Muskegon Development Co. 1 Wamhoff, SW NE NW 18-3n-12w, pumping 190 bbl. daily, after acid, T.D. 1,557 ft., in Traverse lime.

Fisher-McCall Oil & Gas, Inc., 1 Wamhoff, SE NE NW Sec. 18, 220 bbl., acid, T.D. 1,552 ft.

Clifford A. Perry and Gould and Cross 1 Shafer, NW NE SW Sec. 18, flowing 280 bbl., acid, T.D. 1,583 ft.

Perry, Cross & Gould 2 Shafer, NE NE SW Sec. 18, flowing 280 bbl., acid, T.D. 1,600 ft.

Antrim County

Central Lake Township: Edward B. Strom, trustee, 1 Rushton, NW SE NW 23-31n-8w, wildcat, dry, T.D. 1,322 ft.

Arenac County

Adams Township: Pure Oil Co. 3-A McTaggart, SW NE SE 20-19n-3e, 2,400 bbl., acid, T.D. 2,880 ft., Dundee.

Bay County

Kawkawlin Township: Gulf Refining Co. 1 Macey, SW NW SW 34-15n-4e, pumping 62 bbl., acid, T.D. 2,944 ft., Dundee.

Monitor Township: United Drillers & Producers, Inc., 7 Kircher, NW SE NE 3-14n-4e, flowed 200 bbl. in 13 hr., acid, T.D. 2,900 ft.

Clare County

Franklin Township: Mogul Oil Co. 1 Puls, C N½ NW NW 1-20n-3w, wildcat, dry in Dundee, T.D. 4,300 ft.

Winterfield Township: Freeman Oil Co. 2 Sample, C W½ NW SE 2-20n-6w, 125 bbl. in 18 hr., acid, T.D. 3,108 ft.

Rowmor Corp. and D. C. Hughes 3 Wyman, C E½ NW SE Sec. 29, 768 bbl. natural, in Monroe, T.D. 3,753 ft.

Taggart Bros. Co. 37 Nearhood-Lockwood-Marion, C NW Sec. 33, 5,720,000 cu. ft. gas, T.D. 1,347 ft., P.B. to 1,342 ft.

Isabella County

Deerfield Township: Twin Drilling Co. 1 Rhode-Krueger communitized, NW SW SW 7-14n-5w, dry, T.D. 1,328 ft.

Fremont Township: Belvidere Oil Co. 1 Morey, SW NW NW 28-13n-5w, wildcat, dry, T.D. 1,372 ft.

Lake County

Pinora Township: Louis Rose 1 Skidmore, C S½ SE SE 15-18n-11w, wildcat, dry in Monroe, T.D. 3,838 ft.

Ohio Oil Co. 1 Pfuhl, C S½ SE SE Sec. 24, 680 bbl., acid, T.D. 3,632 ft.

Montcalm County

Crystal Township: Leonard Pipe Line Co. 1 Smeed, C SW NW 2-10n-5w, 10,500,000 cu. ft. gas, T.D. 996 ft.

Osceola County

Hartwick Township: Taggart Bros. Co. 1 Yorhouse, C SW 27-19n-8w, wildcat, dry, T.D. 1,749 ft.

Lincoln Township: Taggart Bros. Co. 24 Hoogerhyde et al, C NE 20-18n-10w, 9,550,000 cu. ft. gas, T.D. 1,180 ft.

Pure Oil Co. 4 Small, C S½ SW NE Sec. 29, 55 bbl. per hr. on ¾-in. choke, after acid, T.D. 3,538 ft. in Monroe.

Pure Oil Co. 1 Brock, C S½ SE SW Sec. 20, 2,256 bbl. daily on ¾-in. choke, acidized, T.D. 3,555 ft.

Ottawa County

Holland Township: Lenoran Petroleum Co. 1 Rokus, NW SW SW 10-5n-15w, wildcat, dry, T.D. 1,579 ft.

Van Buren County

Bangor Township: Andrew S. Hoyt, agent, 2 Shugars, NE NW SW 21-2s-16w, pumping 100 bbl., after acid, T.D. 1,000 ft.

Bloomingdale Township: Jetter Drilling Co. 6 Hense, NE NE NW 14-1s-14w, pumping 97 bbl., after acid, T.D. 1,286 ft., Traverse lime.

Bridger-Basin Oil Co. 1 Holdeman, SE NW NW Sec. 11, pumping 50 bbl., after acid, T.D. 1,323 ft.

Clapsaddle & Harris 2 Allen, SE NW NW Sec. 12, pumping 50 bbl., after acid, T.D. 1,298 ft.

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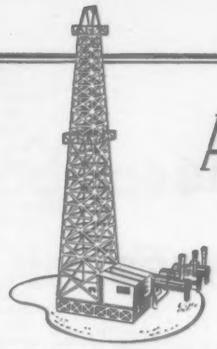


Among the Drilling

NICKLOS Drilling Co., Houston, Tex., is moving a rotary to the Horseshoe Bayou field, St. Mary Parish, Louisiana, where contract was received from the Texas Co. for an 11,000-ft. well. Other operations are reported in the Ville Platte field for Continental Oil Co.

BUTLER & HORNE Drilling Co., Dallas, Tex., has spudded Merry Brothers & Perini and Bells Wells Oil Co. 2 A. M. Wimberly, ¼ mile south of the east end of the Wimberly pool in southern Jones County, Texas. Location is 330 ft. out of the northeast corner of the southeast quarter of Subdivision 106, De Witt County C.S.L. Survey 126.

LOFFLAND Brothers, Houston, Tex., are rigging up in the Lake Creek field, Montgomery County, Texas, for Stanolind 2 McWhorter. In the meantime preparations were being made to test the company's 1 McWhorter, after cementing casing near the total depth of 10,660 ft.

CROSBY Drilling Co., Houston, Tex., is drilling below 10,200 ft. in the company's 1 Poole, a wildcat located on the Lissie prospect, Wharton County, Tex.

HUBBLE Drilling Co., Stroud, Okla., has the contract for a Wilcox sand test in Creek County, Oklahoma, for Anderson-Prichard Oil Corp. The wildcat, in NE NE SW 18-15-7, is north of Stroud and west of Deep Rock Oil 1 Meadors, a pool opener, now being completed.

ROWAN Drilling Co., Houston, Tex., is building rig for Union Oil Co. of California 1 W. C. Driver, an east central Winkler County, Texas, wildcat, 8 miles southeast of Kermit. No. 1 Driver, staked 660 ft. out of the northwest corner Section 19, Block B-6, public school land, on a block originally held by Amerada Petroleum Corp., will drill to 4,200 ft. seeking Keystone lime.

O. W. DYER, Houston, Tex., is preparing to test Atlantic 1 Foster estate, a deep Wilcox test located in the Fostoria area, Montgomery County, Texas. Total depth of the well is 11,794 ft., and a production test is expected to be made above 10,500 ft.

SAM JEWELL, Ada, Okla., is expected to get the contract to drill an Arbuckle lime test east of Hollister, Okla., in eastern Tillman County for Anderson-Prichard Oil Corp. Location, in NW NW NE 28-2s-15w, is on a 1,000-acre farmout from Amerada Petroleum Corp., and contract provides for 100 ft. in the Arbuckle, or about 4,500 ft.

DELTA Drilling Co., Tyler, Tex., was given contract to drill a deep test in the Pittsburg field of Camp County, Texas, by Harry Moss, of Dallas. This will be the second test drilled in the field by Mr. Moss and is located 2,000 ft. from the Moss 1 Venters discovery. The site is on a 60-acre unit made up of 40 acres owned by Moss and 20 acres owned by Arkansas Fuel Oil Co. The test will be known as 1-A W. J. Venters.

CALIFORNIA COMMERCIAL Drilling Co., Bakersfield, Calif., has started the drilling of a well under contract to be known as 2 Marvic Associates in the Midway-Sunset field.

O'DONOHOE & GIBSON, Wichita Falls, Tex., have the contract for 5,250 ft., or Ellenburger lime at Golding & Cochran 1 Kunkel, southwest 30-acre lease of the B.B.B.&C. Survey 11, Abstract 54, about 2½ miles northeast of Olney, Tex., in Archer County.

PATRICK & TYRRELL Drilling Co., Houston, Tex., received contract from H. C. Cockburn for an 8,800-ft. Wilcox test located on the Texas Forest Service-A. & M. College lease in the John T. Lewis Survey, Newton County, Texas. Derrick is up and the rig is being moved to the location.

HARRY L. EDWARDS Drilling Co., Houston, Tex., received contract from W. P. Luse et al for 1 L. Kemp, a wildcat located about 3 miles southeast of the Fannett field, Jefferson County, Texas. Location is in the David Burell Survey.

UNGREN & FRAZIER, Abilene, Tex., contractors, have moved cable-tool machine to location midway between the Avoca field in northeast Jones County and the Ivy field in northwest Shackelford County, Texas, for Merry Brothers & Perini et al 1 A. H. Lundgren. The test is scheduled to explore the Palo Pinto lime and is in the C NW W½ NW 20-3 H.&T.C. Survey.

M. J. DELANEY, Dallas, Tex., has one of his rigs in the Central West Texas district engaged in drilling 2 O. D. Swenson, a western extension location to the Avoca field, Jones County. Rig was moved from 1 Short location where a producer resulted and gave the Avoca field its more recent spread.

BALDRIDGE & KING, San Antonio, Tex., have started a wildcat test in Hidalgo County, Texas, 3 miles northeast of the Nichols field on acreage obtained from Sun Oil Co.

Daylight crew on a rotary of Prince Bros. & Gehle, drilling contractors of Electra, Tex., drilling for States Oil Corp. in the Silver Valley pool of Coleman County, Texas: Pat Moore (driller), Steve Drake, J. L. Elliott, and C. C. Willis. The contractor has three rigs at work for States in Silver Valley

Contractors

locations are in the Dunn lease in 20-18n-10w, one is on the Lloyd Brock fee in 20-18n-10w, and the other is for 1 Gocha-Hewitt, C N½ SE NW 32-18n-10w.

OIL WELL Drilling Co., Midland, Tex., has assigned a rotary rig to a wildcat location between the Harper and Goldsmith fields in Ector County. The firm spudded 1 Johnson, 48-44-1s, T.&P. Survey, last week and is now drilling ahead at shallow depth.

CIRCLE Drilling Co., Mount Pleasant, Mich., is running 5-in. casing in its wildcat test in Van Buren County, Michigan, to test a gas showing at 1,650 ft.

FRANK and FRED JONES, Dallas, Tex., are moving in material to deepen 1 Fette, Cooke County wildcat. The test will be drilled from 1,154 ft. to the Ellenburger lime.

SHERLEY Drilling Co., Mount Pleasant, Mich., has taken contract to drill a test for L. & S. Drilling Co. in Isabella County, Michigan. Location is on the Leach fee, NW SE SE 24-14n-6w, Broomfield Township.

UNION Drilling & Producing Co., Mount Pleasant, Mich., has been assigned contract for Smith Petroleum Co. 1 George Riddering, C E½ SE SE 30-7n-12w, Walker Township, Kent County, Michigan.

HERNDON Drilling Co., Tulsa and Wichita, Kans., drilled Holl & Branine 1 Warner, a semiwildcat which has extended the Raymond pool of western Rice County, Kansas. The well is located in S½ E½ NE 16-20-10w, and came in as a gusher.

JOHN STEELE BATSON, Marietta, Okla., has the contract to drill Walter Neustadt 1 Locke, SE SE SE 8-6s-2e, a wildcat in Love County, Oklahoma, southeast of Overbrook, and was moving in tools last week.

LUPHER Drilling Co., Mount Pleasant, Mich., last week received contracts for four new tests in Osceola County, Michigan. Four rigs have been assigned to Pure Oil Co. locations in Lincoln Township. Two

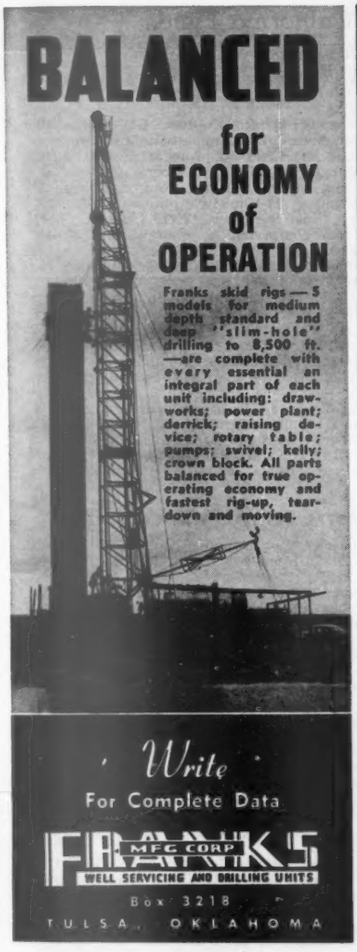
S. J. BROWN, Falls City, Neb., is moving in rotary tools at 1 Eugene Dowell, 31-2n-16e, northeast of Salem, in Richardson County, Nebraska, for Oscar Johnson and Dan Short.

ROBERT ATHA, Mount Pleasant, Mich., has been awarded contract for Ide Oil & Gas Corp. 1 Mary Wilkins, SW SW NW 17-3n-12w, Allegan County, Michigan.

OLSON Drilling Co., Tulsa, has taken contract for Taggart Brothers 1 Wirth, C S½ NE SE 22-21n-3w, Roscommon County, Michigan.

TAFT Well Drilling Co., Bakersfield, Calif., is drilling a deep test in 34-28-27, at Kern Front for Richfield Oil Corp., known as 1 Kramer.

GORMAN-YOAKUM Drilling Co., San Antonio, Tex., is moving rotary rig and tools to location in Jim Wells County, Texas, for a 5,300-ft. test in the northeast corner of Lot 10, Block B, Bode subdivision, Wade ranch land, a mile north of the Wade City field. The drilling company obtained the deal from W. Earl Rowe. Later, Anderson-Prichard joined in the operation.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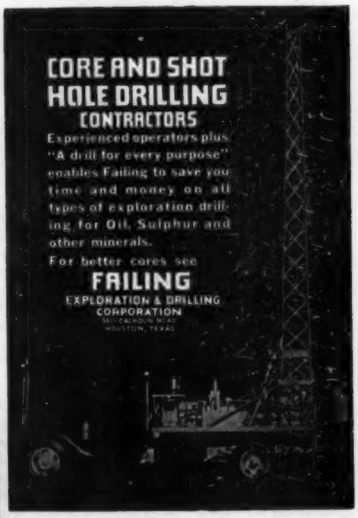
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HOUSTON, TEXAS

Rusk County Wildcat Prepares To Test Nacatoch Sand

By D. H. STORMONT

DALLAS, Tex., Nov. 17.—As the eastern Texas district faced its fourth week of active wildcat exploratory play, operators watched with interest the outcome of testing at several promising projects. Main interest was centered on a Nacatoch sand test in Rusk County. O. W. Killiam 1 Bass, J. I. Sanchez Survey, is preparing to test the sand around the 2,900-ft. level, where, in drilling, it encountered some black oil and a large show of gas. Operator has drilled to 3,200 ft. and he set casing on bottom. Should 1 Bass prove productive, it would open a new pay area for that portion of East Texas.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: East Texas field	6	*263	23,514
Hawkins	3	1,036	14,720
Other fields	1	146	4,031
Dry holes: Wildcats	2		9,424
Total	12		51,689

*1-hour gage.

No. 1 Bass is southwest of the Pleasant Grove pool, where a north offset to the discovery well blew out during the week, spraying gas, oil, and a small amount of water over a considerable area. The offset is M. D. Bryant 1 Ashby, which was bottomed at 4,034 ft., testing 7 ft. of Woodbine sand pay from 4,027 ft. to total depth. Operator had swabbed 3 days and was testing the well when it blew out. The flow was killed with mud without difficulty and, at the end of the week, operator was again preparing to test.

The gas volume was estimated to be considerably larger than that any other producer in the pool has thus far shown. No. 1 Ashby will be the fourth producer in the Pleasant Grove pool, if it is completed as a commercial producer. Location is in the J. R. May Survey.

Paluxy Test Nears Goal in Hawkins Field

On the eastern side of the Hawkins field of southeastern Wood County, Smith Price and Roger Lacy are believed to be in or near the Paluxy sand at 3 Gladys Maberry, the first Paluxy sand test for the pool. No. 3 Maberry was deepened after logging Woodbine oil sand at 4,738-4,830 ft. With elevation of 320 ft., the test topped the Pecan Gap at 3,180 ft., Austin chalk at 4,330-70 ft., and the Georgetown at 5,102 ft. Although no information has been released, the 3 Maberry reportedly has reached 6,166 ft. but whether or not any shows were encountered is not known. Location is in the northeast part of a 52-acre lease in the Castleberry Survey.

Three Wildcat Locations Staked

Two wildcats were announced for Van Zandt County this week and one for Ellis County. Five miles north of Wills Point in Van Zandt County, Robert Lake is expected to start work immediately at 1 Ike Allred, located in the center of a 100-acre tract in the John Blair Survey. The wildcat will be drilled on a 5,000-acre block, which Mr. Lake obtained from Skelly Oil Co. Under contract terms, 1 Allred will drill through the Woodbine sand, expected around 3,400 ft., to the Georgetown, around 4,100 ft., and then, if production has not been obtained and if the structural position warrants, it will be carried deeper to the Paluxy.

The block has been thoroughly checked by geophysics and geology, indicating, according to some geologists, a fault-line prospect, while others are more inclined to expect a pinchout.

Location of the second test in the county has not been announced, but Standard is reported planning a Woodbine sand test on the Hickok & Reynolds block, southwest of Canton. The firm recently completed a seismic survey of the block and the wildcat is a result of the showing. Hickok & Reynolds have drilled three failures in the area.

Paluxy sand production will be sought by S. H. Murphy at 1 J. L. Griffith, James Blair Survey, 3½ miles west of Maypearl in the western part of Ellis County. Murphy is associated with J. W. Miles, T. L. Miles, and M. M. Golliday in the operation. The wildcat will be drilled on a block of several thousand acres, which the operators hold in the area.

Henderson County Pool Opener Gaged

After 3 months of continuous testing, final completion gage was made this week on British American Oil Co. 1 Young in the Joseph Rice Survey, 7 miles southwest of Athens. Opening a new producing area in the eastern Texas district, 1 Young flowed 355.06 bbl. of oil and 31.16 bbl. of water in 24 hours through ⅝-in. choke on tubing. The oil tested 59.5° A.P.I. gravity. Production was from casing perforations at 7,308-41 ft. in the Rodessa series.

No. 1 Young was drilled to 8,474 ft. The well was plugged back and casing perforated at four separate levels before commercial production was obtained.

EASTERN TEXAS COMPLETIONS

Wildcats

Smith County: B. F. Phillips 1 J. C. McCormic, W. W. Avery Sur., 2 mi. NE of Friendship, dry at 4,162 ft.

Wood County: A. L. Andree 1 E. J. Henry, J. Ewing Sur., 1½ mi. S of Golden, dry at 5,262 ft.

East Texas Field

(1-hour gage)

Joiner, Rusk County: Texas 16 L. J. Pinkston, J. B. Codena Sur., 35 bbl., top Austin 3,450 ft., pay 3,653-61 ft.

Kilgore, Gregg County: E. J. Hunter 1 Dickson, S. Baggett Sur., 20 bbl., top Austin 3,527 ft., pay 3,555-60 ft., T.D. 3,600 ft.

Shell 38-A B. F. Laird, J. Wilkerson Sur., 75 bbl., top Austin 3,423 ft., pay 3,470-3,524 ft., T.D. 3,540 ft.

J. Wrather 22-A I.&G.N., M. V. Winkle Sur., 15 bbl. top Austin 3,485 ft., pay 3,548-85 ft., T.D. 5,598 ft.

Longview, Gregg County: Magnolia 13 V. L. Goolsby, G. R. Rains Sur., 80 bbl., top Austin 3,473 ft., pay 3,540-55 ft.

Selby Oil & Gas 27-A Snavley, W. Tyndale Sur., 38 bbl., top Austin 3,487 ft., pay 3,553-60 ft.

Other Field Completions

Cayuga, Freestone County: Amerada 16 H. Berk, E. G. Rector Sur., 146 bbl. in 24 hr., ½-in. choke, pay 1,235 ft., T.D. 4,031 ft.

Hawkins, Wood County: Cable Tool Drilling Co. and O. J. Perrin 1 Laure Isaacs, H. F. Robinson Sur., 97 bbl. in 6 hr., ¼-in. choke, top Austin 4,160 ft., Woodbine 4,416 ft., pay 4,646-4,781 ft., T.D. 4,850 ft.

Humble 1 Aubrey Crisman, M. A. Esparcia Sur. 228 bbl. in 24 hr., ¼-in. choke, top Austin 4,428 ft., Woodbine 4,688 ft., pay 4,715-4,810 ft., T.D. 4,998 ft.

Humble 2 Ella M. Faulk, J. Pollock Sur., 105 bbl. in 6 hr., ¼-in. choke, top Austin 4,189 ft., Woodbine 4,413 ft., pay 4,528-4,768 ft., T.D. 4,872 ft.

EASTERN TEXAS ACTIVE WILDCATS

Angelina County: K. L. McHenry 1 Southern Pine Lbr., 11,220 ft. from N and 1,320 ft. from E lines, J. G. W. Clayton Sur., drilling 5,085 ft.

Fannin County: Damon Oil 1 Chaffin, A. C. Ketchum Sur., 4 mi. NE of Bonham, drilling 1,270 ft.

Henderson County: British American Oil 1 Young, Joseph Rice Sur., 7⅞ mi. SW of Athens, running potential, T.D. 8,474 ft.

Lone Star Gas 2 C. H. Allen, 3,40 ft. from W and 4,780 ft. from S lines, John Lawson Sur., drilling 8,249 ft.

Hopkins County: W. B. Hinton and Talco Asphalt & Ref. 1 S. M. Long, 4,000 ft. from E and 650 ft. from S lines, W. Acquier Sur., S.D. 4,857 ft., awaiting orders.

Houston County: C. P. Culmore 1 G. T. Luncy, John Forbes Sur., 1½ mi. SE of Lovelady, 467 ft. from SE cor. of NE 40-ac. of 310-ac. tract, taking sidewall cores, T.D. 5,016 ft.

Leon County: Hunt Oil Co. 1 D. A. Sullivan, F. Ramirez Sur., 467 ft. from S and E lines of 432.5-ac. tract, drilling 3,260 ft.

Greier Bros. and Jackson 1 G. W. DeVaugh, William Little Sur., 930 ft. from SE and 467 ft. from SW lines, rigging up.

Limestone County: B. F. Weekly 2-A Barron, 660 ft. out of NE cor. 320-ac. tract in E. Mabry Sur., S.I. 5,786 ft.

Navarro County: L. T. Davis 1 W. R. Stevenson heirs. T. J. Jourdan Sur., Bazzett area, 330 ft. from N and 999 ft. from W lines, 120-ac. tract, waiting on cement 105 ft.

Rusk County: O. W. Killiam 1 Bass, J. I. Sanches Sur., 467 ft. from S and 3,200 ft. from E lines, 160-ac. tract, drilling 3,927 ft.

Smith County: Ryan Consolidated 1 D. S. Wright, J. M. Garcia Sur., 10 mi. SE of Mineola, 1,680 ft. from N and W lines of Edgar Pollett Sur., moving in material.

Van Zandt County: H. B. Owenby Drilling Co. 1 C. E. Bogue, South Marshall University, 3 mi. SE of Van, 500 ft. from W and 250 ft. from N of T. Burford Sur., drilling 3,865 ft.

Wood County: R. W. Fair 1 W. T. Boozer, D. T. Fuller Sur., 3 mi. N of Mineola, 467 ft. from S and W lines, 50-ac. tract, approximately 467 ft. from N and E of J. Crockett Sur., waiting on cement 350 ft.

Humble 1 J. C. Snow, 467 ft. from W and 2,250 ft. from N lines, J. B. Crain Sur., swabbing, T.D. 5,023 ft.

California Fields

(Continued from Page 75)

1 Rubel, 22-4n-18w, abandoned in steep-dipping formation, T.D. 7,096 ft., no shownigs of oil or gas worth testing.

Santa Maria, Santa Barbara County: Field Gasoline Corp. 1 Carreaga, 31-8n-33w, abandoned in gray Sisquoc shale at 4,986 ft., formation test 4,100-4,300 ft. showed no oil or gas present.

Santa Maria Valley, Santa Barbara County: George F. Getty 3 Vicente, 27-10n-34w, pumped 480 bbl., 15.1-gravity, 4 per cent cut, T.D. 4,380 ft., perf. 4,180-4,380 ft., completed in Santa Maria Valley zone of Miocene age.

Hancock & Bush 5 Bradley, 26-10n-34w, pumped 151 bbl., 16.1-gravity, 3 per cent cut, T.D. 4,729 ft., perf. 4,131-4,727 ft., completed in Santa Maria Valley zone of Miocene age.

Pacific Western 12 Hobbs, 21-10n-34w, pumped 432 bbl., 15.2-gravity, 3 per cent cut, T.D. 4,706 ft., perf. 4,327-4,698 ft., completed in Santa Maria Valley zone of Miocene age, Franciscan basement 4,632-41 ft.

Shiells Canyon, Ventura County: Security Land & Royalty Co. 1 Calumet Security, 3-3n-19w, pumped 50 bbl., 31.9-gravity, 8 per cent cut, T.D. 3,205 ft., perf. 3,027-3,197 ft., completed in Sespe formation of Miocene age, flows 25 bbl. per day through casing.

COASTAL DISTRICT WILDCATS

Aliso Canyon district, Los Angeles County: Associated 1 Mission, 26-3n-16w, T.D. 6,750 ft. in siltstone, elev. 2,709 ft.

Shell 2 Mission, 25-3n-16w, building rig.

Castaic district, Los Angeles County: Texas 1 Fernando, 11-4s-17w, drilling 4,553 ft. in sand and shale, elev. 1,251 ft.

Cat Canyon district, Santa Barbara County: A. E. Bell 1 Gilmore, 23-9n-33w, T.D. 6,180 ft., 7-in. casing cemented 4,930 ft., deepening after swabbing 150 bbl. daily, would not flow, will whipstock.

Standard 3 Los Flores, 27-9n-33w, drilling in sand and sticky shale 6,100 ft., elev. 1,065 ft.

Union 12 Bell, 27-9n-33w, rig, is offset to Standard 2 Los Flores.

Union 13 Bell, 27-9n-33w, rig.

Loma Grande district, Monterey County: Loma Grande Oil Co. 1 Corey, 23-24s-10e, T.D. 3,575 ft. in shale, sidetracked fish and cemented 6⅝-in. casing 3,575 ft., elev. 1,500 ft.

Newhall district, Los Angeles County: Aztec Oil Co. 1 Sanborn, 6-3n-16w, T.D. 6,113 ft. in Miocene sand and sandy shale, swabbed dry, may deepen, elev. 1,516 ft.

R. W. Young 1 Walker, 11-4n-16w, drilling 5,930 ft. in hard gray sand and hard siltstone, had oil and gas shows on ditch, top Miocene 5,078 ft., elev. 1,254 ft.

Oak Canyon district, Los Angeles County: Western Gulf 1 Wickham, 31-5n-17w, drilling 7,005 ft. in sand, being drilled by Kern Drilling Co., elev. 1,916 ft.

Hathaway Co. 2 Ram, 31-5n-17w, T.D. 8,091 ft. in sand and shale, P.B. 2,529 ft. to whipstock.

Towsley Canyon district, Los Angeles County: Barnsdall and Ambassador Pet. 1 Limebocker, 17-3n-18w, drilling 4,041 ft. in hard sand and shale, landed 9⅝-in. protection string 4,040 ft., elev. 1,680 ft.

Rocky Mountain Area

(Continued from Page 78)

Nepstad-Montgomery-Fargher 4 Haugen-2, CSL SW SW 2-35n-3w, T.D. 1,600 ft., fishing.

Dakota-Montana Oil 26 Government, CNL NE NW 19-35n-1w, spudded.

Gordon Plotke 4 Ward, SE SW SW 28-35n-3w, T.D. 1,500 ft., setting 7-in.

Superior Pet. 4-A Government, C SE NW 24-35n-3w, T.D. 1,619 ft., contact 1,610-13 ft., acid 500 gal., no results, standing.

Frank P. Walsh 1 Dempter, C NE SW 20-33n-2e, drilling 600 ft., Devon field.

L. J. Yealy 17 Shaw, NE NE SW 35-36n-2w, location.

C. Leonard Smith 1 Lewis, NE SW NW 34-33n-2e, Devon district, standing 750 ft., 4½-in. cemented.

Montana-Dakota Utilities 1 Reicker, C NW SE 11-36n-3w, drilling and coring 2,151 ft.

Coolidge & Coolidge 3 Jones, CSL SE SW 28-34n-1w, rigging, first report.

Kalispel-Kevin Oil 4 State, C SE SW 16-34n-1w, location, first report.

Rimrock Oil 8 Schmidt, SE SE NW 29-35n-3w, drilling 180 ft., first report.

Big Gas Flow Logged in Bayard Sand in Allegheny County

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Nov. 17.—Fair wells were reported from all districts of the lower eastern fields with the largest strike, a Bayard sand gas well, being in Southwest Pennsylvania. In Monongalia County, West Virginia, an Oriskany wildcat is drilling in the sand with poor results to date.

In Forward Township, Allegheny County, Peoples Natural Gas Co. completed the largest Bayard sand gas well in recent years in its test on the Kate A. Hayden farm at a depth of 2,766 ft. It gaged 9,000,000 cu. ft., open flow.

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. bottomed 5 Piedmont Coal Co. at 7,080 ft., or 306 ft. below the top of the Oriskany sand. The volume is 1,000,000 cu. ft. of gas a day. No. 4 is drilling at 7,473 ft. and after cementing back has started a new hole at 7,432 ft.

Here, New Penn Development Co., William E. Snee et al are drilling 1 Kirby at 6,521 ft., 1 Carothers at 7,092 ft. after cementing back, and 4 Heyn at 2,668 ft. Greensboro Gas Co. reached 6,858 ft. in the test on the Barton heirs farm and is drilling in black shale.

In South Huntington Township, Fayette County, Peoples Natural Gas Co. is drilling at 4,727 ft. in the test on the Jacobs Creek Oil Co. on a closure on the Fayette anticline. It is definitely determined now that this will be drilled to the Oriskany sand.

In Maryland, the test of the New Penn Development Co. and William E. Snee reached 8,163 ft. on the Schartzer (Humberson) farm on the Accident dome in Garrett County, and have whipped off the line and fishing tools.

SUMMARY OF COMPLETIONS

Southwest Pennsylvania

	No.	Bbl.	Footage
Oil wells	1	4	1,962
Gas wells	10	*12.2	29,702
Dry holes	1	.....	3,315
Total	12	....	34,979
Recompletions	2	*0.4	.....

West Virginia

	No.	Bbl.	Footage
Oil wells	6	17	13,075
Gas wells: Oriskany	3	*11.8	6,652
Other	5	*1.0	10,824
Dry holes	3	.....	8,198
Total	17	.....	38,749
Recompletions: Oil wells	1	2	.....
Gas wells	2	*0.3	.....

*Million cu. ft.

Armstrong County

Burrell Township: Charles Moesta 1 Robert Boarts, 33,000 cu. ft. gas, Murraysville sand, drilled through Bradford to 3,382 ft.

Kiskiminitas Township: C. W. Beecher Gas Co. 1 Henry Burkett, 42,000 cu. ft. gas, Bradford sand, T.D. 3,504 ft.

Kittanning Township: Peoples 2 M. J. Baker, 127,000 cu. ft. gas, Murraysville, Fifth, and Sixth sands, T.D. 3,295 ft.

Manor Township: Local Co. 1 Claude Wray, 10,000 cu. ft. gas, Speechley and Sheffield, T.D. 3,878 ft.

Plum Creek Township: Peoples 1 Elizabeth McCafferty, 536,000 cu. ft. gas, Murraysville, Hundred Foot, and Thirty Foot sands, T.D. 1,530 ft.

Butler County

Middlesex Township: Robert Marshall et al 1 Austin (Whiteside), 1,884,000 cu. ft. gas, 2 ft. in Fourth sand, T.D. 1,897 ft.

Clarion County

Porter Township: Sedgwick & Crumb 1 J. C. Simpson 61,900 cu. ft. gas, Hundred Foot and Fifth sands, T.D. 2,660 ft.

Red Bank Township: T. W. Phillips 2 J. C. Swarts, dry, through Bradford sand, T.D. 3,315 ft.

Greene County

Jackson Township: Manufacturers 2 Mary E. Smith, 400,000 cu. ft. gas, Bayard sand 3,354-58 ft., gas 3,355 ft., T.D. 3,381 ft.

Morris Township: Manufacturers 1 John B. Carter, 77,000 cu. ft. gas, Big Injun sand at 2,225 ft., drilled through Bayard to 3,409 ft.

Springhill Township: Carnegie 1 Jessie M. Anderson, drilled deeper through Bayard sand to 3,405 ft., P.B. to Injun sand to produce 81,000 cu. ft. gas.

Washington County

Donegal Township: Manufacturers 2 George S. Chaney, drilled deeper, 360,000 cu. ft. gas, Gordon sand 2,594-2,609 ft., gas 2,601-02 ft., T.D. 2,627 ft.

Hanover Township: Coulter & Duncan 1 Hood heirs, 4 bbl. and 3,000 cu. ft. gas, Fifty Foot sand, T.D. 1,962 ft.

WEST VIRGINIA

In Monongalia County, the wildcat of the Hope Natural Gas Co. on the H. C. Greer et al lease in Morgan district, topped the Oriskany sand at 7,570 ft. and at 25 ft. in that member there was no added gas. About 34,000 cu. ft. gas is now carried from the Onondaga chert.

In Lewis County, the rotary test of the Hope Natural Gas Co. on the Alfred Woofter farm in Freemans Creek district, bottomed at 7,325 ft.; showed 250,000 cu. ft. of gas 2 hours after the Oriskany section was shot. A second shot was to be given but this exploded prematurely (200 qt.) and the hole is now bridged.

Braxton County

Birch district: South Penn 1 C. H. Juergens, dry, through Berea, T.D. 2,854 ft.

Otter district: Pittsburgh & West Virginia Gas Co. 7367 G. B. Howell, drilled deeper, 139,690 cu. ft. gas before shot, Injun sand, T.D. 1,963 ft.

Calhoun County

Sherman district: McCall Drilling Co. 2 Robert Smith, 189,000 cu. ft. gas, Big lime 2,000-63 ft., Big Injun 2,063-2,147 ft., gas 2,113-33 ft., shot, T.D. 2,190 ft.

Godfrey L. Cabot, Inc., 1 Alva Elliott, dry, through Berea, T.D. 2,329 ft.

Washington district: Hope 8575 Gertrude B. Howell, 82,000 cu. ft. gas, Big lime 1,894-1,980 ft., Big Injun 1,980-2,076 ft., gas 2,074 ft., T.D. 2,129 ft.

Doddridge County

Grant district: Clifton Oil & Gas Co. 2 Dallas Powell, 74,500 cu. ft. gas, Gordon sand 2,675-90 ft., gas 2,683-85 ft., T.D. 2,701 ft.

Gilmer County

Troy district: W. H. Mossor 1 P. P. Gregg, 1 bbl. and 100,000 cu. ft. gas, Berea, T.D. 2,620 ft.

Harrison County

Coal district: Norwood Gas Co. 2 Consolidated Coal Co., small show gas, Speechley sand 3,186-88 ft., gas 3,187-88 ft., T.D. 3,285 ft.

Lewis County

Freemans Creek district: Hope Natural Gas Co. 1 W. H. Frost, 150,000 cu. ft. gas, former small oil producer with oil now cased off, Injun sand, T.D. 2,100 ft.

Courthouse district: Cove Lick Oil & Gas Co. 1 Timothy Rafferty, 3 bbl. and 75,000 cu. ft. gas, Berea, T.D. 2,678 ft.

Lincoln County

Harts Creek district: Hope 8579 R. E. Chapman, 57,200 cu. ft. gas after 60-qt. shot, Big lime 1,853-2,019 ft., Big Injun 2,019-70 ft., Berea 2,530-55 ft., T.D. 2,581 ft.

Mingo County

Harvey district: Breeden Oil & Gas Co. 1 P. M. Moore (Hiram Stafford), 570,000 cu. ft. gas, Maxton sand, T.D. 1,223 ft.

Pleasants County

Grant district: Arthur M. Cokeley 2 R. M. Johnson, ½ bbl., Maxton sand, T.D. 1,520 ft.

McKim district: Hogpen Oil & Gas Co. 1 United Bank of Middlebourne, 2 bbl. and 170,000 cu. ft. gas, Injun sand, T.D. 1,961 ft.

Ritchie County

Clay district: Howard H. Ham 1 Lew Carroll, 2 bbl., Injun sand, an old producer reclaimed.

Murphy district: Watson Oil & Gas Co. 1 J. W. Haddox, 2 bbl., Salt sand, 133,000 cu. ft. gas, Maxton sand, T.D. 1,833 ft.

Union district: Hope 8558 John E. Welling, 8 bbl. and 49,000 cu. ft. gas, Injun sand, T.D. 2,201 ft.

ORISKANY GAS FIELDS

Jackson County

Ripley district: West Virginia Gas Co. 1 E. J. Carney,

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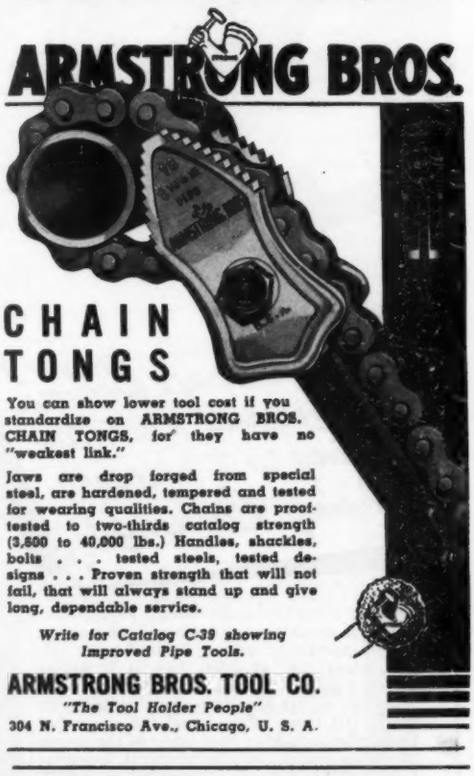
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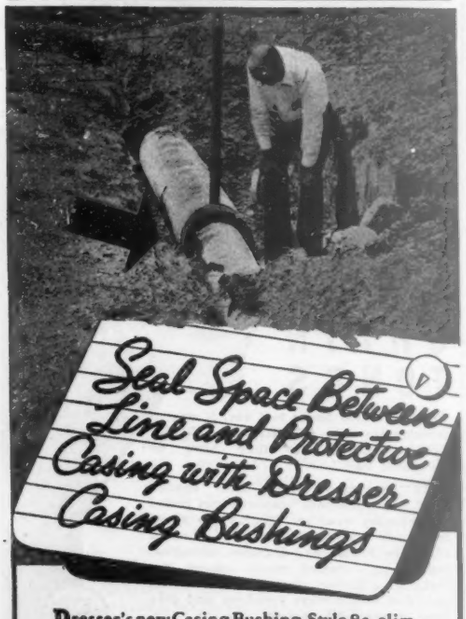

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Columbian Carbon Co. 1 W. O. Carney, 1,295,000 cu. ft. gas before shot, Corniferous 4,853 ft., Oriskany 4,970 ft., T.D. 5,043 ft.

Kanawha County

Poca district: Joe Rubin 1 Lenna Bailey, 500,000 cu. ft. gas before acidizing, Big lime, T.D. 1,496 ft.

Texas Gulf Coast Fields

(Continued from Page 77)

120 bbl., ⅛-in. choke, perf. casing 7,713-17 ft., T.D. 8,125 ft.

Ohio 4 Cornelius, 128 bbl., ⅛-in. choke, perf. casing 7,718-23 ft., T.D. 8,120 ft.

West Columbia, Brazoria County: Texas 26 Phillips, 353 bbl., pumping, T.D. 5,982 ft.

West Ganado, Jackson County: Pure 4 Cravens, 113 bbl., ⅛-in. choke, perf. casing 4,755-70 ft., T.D. 5,553 ft.

West Ranch, Jackson County: Magnolia 197-A West Ranch, 6,200,000 cu. ft. gas, open 2-in. tubing, perf. casing 5,040-60 ft., T.D. 5,065 ft.

Magnolia 210-A West Ranch, 116 bbl., 7/64-in. choke, perf. casing 5,756-61 ft., T.D. 5,766 ft.

Magnolia 216-A West Ranch, 176 bbl., 7/64-in. choke, T.D. 5,750 ft., P.B. T.D. 5,748 ft.

Magnolia 217-A West Ranch, 129 bbl., 7/64-in. choke, perf. casing 5.747-51 ft., T.D. 5,755 ft.

Withers, Wharton County: F. W. Michaux 26-A Pierce, 162 bbl., 5/32-in. choke, perf. casing 5,364-68 ft., T.D. 5,415 ft.

Texas 81-B Pierce, 19 bbl. 19 hr., 3/32-in. choke, perf. casing 5,541-48 ft., T.D. 5,549 ft.

TEXAS GULF COAST DRILLING REPORT

Brazoria County: H. A. Potter 1 McDonald, W. D. C. Hall Sur., T.D. 8,700 ft., P.B., sidetracked, drilling shale and lime 8,521 ft.

Jefferson County: Stanolind 1 George D. Anderson, T.&N.O. Sur., T.D. 8,711 ft., 7-in. casing 8,499 ft., waiting on cement.

Glenn McCarthy 1 Crawford, R. H. Parker Sur. 158, drilling shale 5,606 ft.

Matagorda County: W. S. McDaniel 1 Howard, L. Ramey Sur., T.D. 2,140 ft., awaiting orders.

Walker County: Joe Ehlinger 1 Foster estate, J. Wilson Sur., S.D. 2,320 ft.

Wharton County: Wynn Crosby 1 Poole, A. J. Fry Sur., drilling shale 10,143 ft.

Louisiana Gulf Coast Fields

(Continued from Page 82)

Allen Parish: J. A. Hafner, Jr., 1 Nevils, 10-7s-6w, 10¾-in. casing 1,032 ft., drilling plug.

Calcasieu Parish: Union Oil Co. of California 1 Gray, 4-11s-9w, drilling shale 6,053 ft.

Cameron Parish: Superior Oil Co. of California 1 Paggi, Lakeside field, T.D. 10,178 ft., lost circulation.

East Baton Rouge Parish: Texas Progress Oil Co. 1 Nelson, 74-8s-1e, drilling shale 8,670 ft.

Iberia Parish: Gulf 2 Petit Anse Co., Avery Island dome, 25-13s-5e, T.D. 11,009 ft., making electrical survey.

Jefferson Davis Parish: Cities Service Oil Co. 1 Lacassine Co., 36-11s-5w, drilling sand and shale 6,215 ft.

Rapides Parish: Placid Oil Co. 1 Bentley Lumber Co., 11-4n-5w, drilling shale 1,220 ft.

St. Martin Parish: Amerada 1 St. Martin Land Co., 19-9s-8e, drilling shale 9,388 ft.

St. Mary Parish: Texas 7 State Cote Blanche, Township 15s-7e, drilling shale and lime 8,994 ft.

Illinois Fields

(Continued from Page 65)

3,100 ft., perf. 3,050-3,100 ft., T.D. 3,100 ft., Aux Vases 3,051-61 ft.

West Centralia, Clinton County: McCullough et al 5 Coe, SW SE SW 14-1n-1w, dry at 1,459 ft., Benoist 1,454 ft., show oil 1,454-59 ft.

McCullough et al 4 Coe, SW SW SW 14-1n-1w, location abandoned.

Westfield, Clark County: Forrest Oil 1 E. P. Daly, N½ NW SE 8-11n-14w, dry at 305 ft., Casey sand 227 ft.

Woodlawn, Jefferson County: L. B. Jackson 1 Toney Myers, SW SE NE 34-2s-1e, dry at 1,971 ft., junked hole.

Magnolia 2 Walker-Kaminski Comm., NW NW SE 2-3s-1e, pumped 54 bbl. oil and 2 bbl. water, 5-qt. shot 1,964-66 ft., Benoist 1,957 ft., T.D. 1,966 ft.

Kansas Fields

(Continued from Page 68)

SW NW SW 9-23-13e, dry, T.D. 2,365 ft., Arbuckle 2,173 ft.

Walter, Ellis County: Imo Oil & Gas 1 Gunther, S½ SW SE 35-11-18w, pumped 311 bbl., Arbuckle 3,580 ft., 5-in. 3,580 ft., acid, T.D. 3,588 ft.

Westhusin, Rooks County: Plainstock Oil and Helmerich & Payne 2 Westhusin, W½ SE SE 11-9-17w, old well, old T.D. 3,258 ft., Lansing 3,316 ft., T.D. 3,319 ft., pumped 632 bbl. oil and some water.

Zenith, Stafford County: Stanolind 12 Richardson, N½ NW 10-24-11w, pumped 367 bbl., 12 per cent water, Viola 3,746 ft., 5-in. 3,747 ft., acid, T.D. 3,797 ft.

Pure 2 Kreys, NW NW SE 14-24-11w, old well, old T.D. 3,823 ft., Viola 3,817 ft., T.D. 3,844 ft., flowed 5,285 bbl. (old potential).

Miscellaneous, Cowley County: Roth Oil & Gas 4 Gretsinger, SE SE NW 15-31-4e, temporarily abandoned. T.D. 780 ft.

Barada Pool Provides Nebraska's Only Activity

ST. JOSEPH, Mo., Nov. 17.—Skelly Oil Co.'s development of its new Barada pool was practically the only activity in Nebraska during the past week—both the Falls City pool and the Shubert pool of Richardson County being entirely shut down. Skelly 3 Roesch, W½ SW NW 36-3n-16e, which was scheduled to test the Hunton lime this week end developed a leak at the bottom of the casing and was running a squeeze job. The hole is bottomed at 2,502 ft. in saturated Hunton lime.

Its 1 Steinbrink, in E½ SE NW 36-3n-16e, started up and was immediately shut down for repairs. The 1 Merz, E½ NE NE of Section 35, was building derrick.

Oscar Johnson and Dan Short of Falls City were digging cellar and pits for 1 Dowell, wildcat, in 31-2n-15e, northwest of Salem, in Richardson County.

Northwest Missouri Tests Drilling

Ohio Oil Co. 1 Meek, wildcat 300 ft. north of the center of 29-55n-35w, 11 miles south of St. Joseph, in Buchanan County, Missouri, was dry at 2,344 ft. in the Mississippi lime topped at 1,306 ft. Other tops included Hunton, 1,712 ft.; Viola, 2,053 ft.; St. Peter, 2,225 ft., and Arbuckle at 2,283 ft.

Eastman et al 2 Triangle ranch, in NE SW NW NW 7-37n-28w, St. Clair County, was dry and abandoned at 440 ft. Operators planned to move to 1 Barber, in SW NW 2-37n-29w, Vernon County, when high water subsided. Mud and water stopped virtually all operations the past week.

Munsell 4 fee, in SE NW SE 18-49n-32w, Jackson County, was spudding.

Southern Iowa Has One Operation

Fletcher E. Hunt 1 McConnell, SE SE 11-78n-30w, Guthrie County, 30 miles northwest of Des Moines, Iowa, was drilling at 1,825 ft. in the Galena, in blue and brown dolomite with considerable quartz. The operator recently resumed work after a long layoff because of an automobile accident.

North Louisiana—Arkansas

(Continued from Page 70)

bring the total wells to only two, is starting two new outpost tests but in the same section. The 1 J. M. Bishop and the 1 J. H. Holloway are both located in 13-18-17. This new drilling is also marked by the return to the El Dorado district of H. L. Hunt, whose Placid Oil Co. will drill the third of the three new operations planned. The Placid test is 1 J. M. Bishop, 14-18-17.

The recent completion by Atlantic, which was the second well in the area, was 1 Briggs, SW SW 13-18s-17w, which made 336 bbl. daily through casing perforations from 5,658-62 ft., total depth 5,785 ft.

ARKANSAS COMPLETIONS

Wildcat

Union County: Atlantic Ref. Co. 1 Davis unit, NE NW 15-17s-18w, elev. 232 ft., perf. casing 7,166-68 ft., flowed 251 bbl. oil with no water daily, T.D. 7,373 ft., T.P. 2,050 lb., C.P. 2,375 lb., gas-oil ratio 2,000-1.

Fields

Nick Springs, Union County: Delta Drlg. Co. 1 Nelson, SW NE 36-17s-15w, dry at 3,822 ft.

Smackover, Union County: Gulf 3 Holloway, NW SE 6-16s-16w, dry at 2,560 ft.

Urbana, Union County: Marine Oil 3-B U. S. M., NE SW 2-18s-13w, 20,000,000 cu. ft. gas, perf. casing 3,159-64 ft., 3,260 ft., T.D.

Oklahoma Fields

(Continued from Page 72)

Love County: Walter Neustadt et al 1 Wilkins, SE SE 8-6s-2e, tools on location.

McClain County: Patsy Oil 4 Caldwell, SE NE SE 16-5-3, Byars pool outpost, drilling 1,000 ft.

Stephens County: William H. Adkinson et al 1 Retainers Insurance, SE SW NW 3-2-9w, first report.

Glen Grimes et al 3 Baker, NW SE NE 35-2s-6w, oil sand 1,851-55 ft., T.D. 1,855 ft., waiting for machine.

Tillman County: Anderson-Prichard 1 Lock, N½ NW NE 28-2s-15w, first report.

North and East

Hughes County: W. K. Jones et al 1 Bryant, SE SW SW 29-5-9, surface pipe.

H. G. Marshall et al 1 Hundley, W½ SW SE 27-5-10, drilling 4,971 ft. in Atoka.

Keener Oil & Gas 1-A Norton, NE NE NW 6-9-10, drilling 3,220 ft. in Cromwell.

Barnsdall 1 Skinner, SE SW NW 11-9-10, first report.

California Is Perturbed by Diminishing Gas Reserves

By L. P. STOCKMAN

SAN FRANCISCO, Calif., Nov. 17.—Production and consumption of natural gas, which has been occupying the spotlight almost exclusively during the past few weeks in meetings of the state Railroad Commission, is a source of concern to some due to a decline in production and a substantial increase in consumption. In addition to the large gain in demand for natural gas, the demand for liquefied petroleum gas has grown to tremendous proportions and will show a further increase during the coming winter months. For many years the natural-gas division of the petroleum industry has received very little attention. Yet every investigating body for many years has recommended the adjustment of gas outlets or the taking of gas deliveries ratably. There is a possibility that natural gas in California will be declared a public utility in 1942 and as such will come under supervision of the California State Railroad Commission.

It is not the present intention to interfere in any way with the production of natural gas from oil fields except and until the gas enters commercial channels. California, however, has a valid gas law that prohibits gas waste and this can be used under certain conditions. The gas-distributing companies such as Pacific Gas & Electric Co., Southern California Gas Co., Santa Maria Gas Co. and others of similar character are already operating as public utilities under direct supervision of the Railroad Commission, a regulating body that has considerable power and which fixes and establishes the rates to be charged for gas and prescribes the quality of gas served. The commission also grants certificates of convenience which permits expansion work and exercises such other varied duties as are prescribed by statute.

A series of meetings have been held during the past few weeks to take testimony and compile required data but the start of the present investigation really dates back to last March when it was announced that the Railroad Commission and the Department of Natural Resources had decided to undertake a joint investigation into the supply and utilization of natural gas in order to preserve its greatest benefits for the general consuming public. At that time the Railroad Commission had pending before it applications of the Southern California Gas Co., Southern Counties Gas Co. and Santa Maria Gas Co. seeking authority to discontinue service to certain industrial customers at such times as natural gas may be required for the maximum benefits of the public.

Fuel-Oil Standby Units

Shortly thereafter the Railroad Commission instructed all users of surplus gas to install fuel-oil standby units to protect defense work against shutdown in the event a cold spell should necessitate a discontinuance of commercial deliveries in order to take care of increased demand of householders for heating and cooking. Commissioner Ray L. Riley in Los Angeles recently announced at a Railroad Commission hearing that householders will be given preference in the use of gas and that the surplus gas supply is now inadequate to sustain both industrial and home users in an unusually cold spell. This was merely reiterating a rule laid down by the commission several years ago and at which time the commission also ruled that natural gas produced as a result of oil-field development would take priority over gas produced from dry gas fields.

In order to make a sound determination of the applications filed by the several gas companies for authority to discontinue commercial deliveries under certain conditions, the Railroad Commission decided to make a thorough study of the natural-gas situation throughout the entire state. Jurisdiction over these matters lies partly with the Railroad Commission and partly with the state Department of Natural Resources. The two state agencies are receiving splendid assistance and cooperation from all gas utilities, oil and gas producers and natural-gasoline operators. Complete information of the present reserves, transmission and distribution facilities is essential before reaching conclusions as to any steps which may properly be taken to further proper and efficient use at fair and reasonable rates to the public consistent with conservation of natural gas. The state Railroad Commission and the Department of Natural Resources have jointly retained Professor Dodge of the University of Southern California to make an exhaustive study of the situation and Professor Dodge has been working on the matter for about 6 months. His report is not yet completed.

Object of Investigation

The object of the investigation is to obtain comprehensive knowledge on present and future gas reserves and to formulate a program for their better control and more efficient utilization. This means that no single gas utility can monopolize the supply of natural gas even though it holds contracts for the purchase of such gas. This is of special interest to Southern California companies because it will tend to guarantee a source of supply as long as natural gas is available. It is also important because of the large number of dry gas fields in the central part of the state and immediately adjacent to the San Francisco Bay region. It is possible that within a short time the San Francisco area may be supplied with gas from some of the dry-gas fields in that region and much of the gas from Kettleman North Dome field which is now going to San Francisco could be switched southward. This is important because the areas of largest population are in the southern part of the state.

The joint investigation will when completed cover the (1) occurrence and geographical location of present and possible future gas reserves; availability of reserves; relationships between reserves of dry gas and casinghead gas and their most efficient use; (2) survey of possibility of utilizing underground storage as equalizing reservoirs between summer and winter gas demands, thus better protecting the supply for the basic domestic and commercial gas user and having in mind the incidental effect on the recovery of oil; (3) adequacy of means of transmission and distribution of natural gas from the fields to the major markets; (4) analysis of customer usage by classes of service and estimates of future requirements of various classes of service; (5) formulation of marketing policies and plans of procedure from source to ultimate consumer to insure the highest degree of utilization of California's natural-gas resources, primarily in those classes of service where it has the highest utility of use; (6) the effect of the factors referred to above, and other factors, upon the cost of production, transmission and distribution of natural gas and upon rates ultimately fixed by the Railroad Commission.

Large Users Oppose

Some opposition has developed to the proposed plan of natural-gas regulation primarily from large commercial users of gas in manufacturing plants. There is no valid reason why cement plants and other large users of natural gas should use gas instead of fuel oil except during periods of large excess production. What the commission does not like is the fact that these large users of natural gas are indirectly forcing operators in the Rio Vista and other dry-gas fields to produce gas to meet the requirements of large manufacturing concerns. Ray Wehe, gas and electric engineer of the Railroad Commission, at a recent hearing presented comparative figures showing the situation from a purely academic standpoint. Mr. Wehe showed that on January 22, 1937, one of the coldest days in a decade, the demand by commercial users totaled 394,000,000 cu. ft. Total supply available was 459,000,000 cu. ft. but with a surplus demand of 216,000,000 cu. ft. in addition to the 394,000,000 cu. ft. there was a deficit of 151,000,000 cu. ft. Since that time there has been an increase of 28 per cent in the consumption of natural gas and should a day similar to January 22, 1937, occur now, it would be necessary to have an over-all total available supply of 668,000,000 cu. ft. At present the available supply approximates 525,000,000 cu. ft. leaving a deficiency of 143,000,000 cu. ft. should a cold spell occur. Because of this the Railroad Commission has advised manufacturing concerns to immediately install standby fuel-oil units to take over in case of a cold spell.

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Multizoned North Tinsley Leads in Development

By R. MARNE SANFORD

JACKSON, Miss., Nov. 17.—The trend toward more extensive exploitation of the McGraw sand at the near 6,000-ft. level in the Tinsley field, together with the abandonment of a closely watched 10,000-ft. wildcat in Lawrence County, held the spotlight of the past week's work in the State of Mississippi.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Tinsley ...	6	4,096	30,651
Dry holes: Wildcats	1	.....	10,808
Tinsley	1	.....	5,065
Total	8	.....	46,524

The extreme north end of the Tinsley field is probably destined to embrace the most prolific section of the entire field. Attention has been centered on this area for the past several weeks and new work is being started at all times. During the past week a new well was completed from the relatively little developed McGraw sand at the 5,800-ft. level, and another test was preparing for completion from the McGraw sand. Both of these wells are in the same section as the Union Producing Co. 2 Powell, NW SW 36-11n-3w, which opened the also little developed and unnamed sand between the Tammons level and the deepest Powell sand.

Both the Powell sand and the Tammons sand are found most consistently in this northern part of the field; thus there are now present and open to production the Tammons, unnamed sand, Slick sand, McGraw sand, and the deeper Powell sand, all in the north end of the Tinsley field.

The new well this week was Sinclair Wyoming Oil 1 McGraw, NE W¼ 36-11n-3w, one location west and slightly north of the Union 2 Powell discovery well in the Powell sand. The 1 McGraw topped the Tallahatchie at 1,500 ft., Wilcox 1,827 ft., Midway 3,941 ft., Selma 4,710 ft., Woodruff 4,896 ft., Perry sand 5,333 ft., Slick sand 5,407 ft., and the McGraw sand at 5,820 ft. Casing was first perforated from 5,020-30 ft. and the well flowed 380 bbl. of oil in 7 hours. When shut in and again opened only salt water flowed from the hole.

Unsuccessful perforations were then made from 5,760-65 ft. and 5,819-24 ft. Finally the hole was cemented and drilled out to 5,831 ft. and casing perforated from 5,819-25 ft. a second time and the well kicked off to gage 739 bbl. into tanks in 24 hours. The flow was through ⅝-in. choke under pressures of 105 lb. on tubing and 180 lb. on casing. The pressures were very low; however, the daily potential indicates a considerable reservoir of oil in this McGraw sand.

In this same section and an offset well, Slick-Urschel 21 Slick is bottomed at 5,804 ft. after topping the Woodruff at 4,225 ft., Perry sand at 5,258 ft., Stevens sand at 5,346 ft., and McGraw sand at 5,741 ft. The sand was found to be 24 ft. in thickness at this point and the hole was bottomed at 5,803 ft., where 7-in. casing has been cemented. Testing will start this week.

Deep Test Dry Below 10,000 Ft.

In Lawrence County, Tide Water 1 Denkman Lumber Co., NE SW 5-5n-11e, was abandoned as dry at a total depth of 10,808 ft. It topped the Yazoo at 1,838 ft., Moody 2,180 ft., Cook Mountain 2,220 ft., Wautubee 2,495 ft., Sparta 2,618 ft., Chalk 2,960 ft., Tallahatchie 3,350 ft., Wilcox 3,587 ft., Midway 7,025 ft., Selma 7,760 ft., and Tuscaloosa at 9,343 ft. There were no shows reported in any of the horizons. This is one of the deepest tests ever drilled in southern Mississippi and will probably do much to limit the spread of the prospective Wilcox play to the east out of the southwest corner of the state.

Offer Made for Oil From Morgan Discovery Well

Although the Morgan 1 Whitworth, NW SW 4-11n-3e, in Madison County, a prospective discovery well or 2-mile-southeast extension to the Pickens field some 2 weeks ago, is drilling deeper at present, a price has been set for its oil should the operator eventually plug back for completion from the first tested zone. It is reported that Allied Pipe Line Corp. has extended an offer to take the 41-gravity oil found in the well at a price of $1.08 per barrel should commercial production develop.

The 1 Whitworth is now drilling below 5,325 ft. and has reported the following geological markers: Wilcox 1,206 ft., Midway 3,050 ft., Clayton 3,810 ft., Selma 3,840 ft., Eutaw 4,778 ft., and base of Wilburn at 4,889 ft. Should deeper production fail, it will be plugged back and tested from 4,807-27 ft., where 360 ft. of 41-gravity oil was recovered on a 10-minute test 2 weeks ago.

Tinsley Field Gets New Production High

A new high for daily average oil produced from the Tinsley field, as well as a new high in daily average production for the State of Mississippi, was set the past week. Tinsley production averaged 75,806 bbl. daily the past week, or some 10,000 bbl. daily more than the previous week's high of October 21. The new state high was 76,294 bbl. daily. Union Producing Co.'s daily production of 31,687 bbl. and Hassie Hunt's average daily production of 12,075 bbl. accounted for most of the raise.

MISSISSIPPI COMPLETIONS

Wildcat, Lawrence County: Tide Water 1 Denkman Lumber Co., NE SW 5-5n-11e, base Catahoula 1,550 ft., Yazoo 1,838 ft., Moody's Branch Marl 2,180 ft., Cook Mountain 2,220 ft., Wautubee 2,495 ft., Sparta 2,618 ft., chalk 2,960 ft., Tallahatchie 3,350 ft., Wilcox 3,587 ft., Midway 7,025 ft., Selma 7,760 ft., Tuscaloosa 9,343 ft., dry at 10,808 ft.

Tinsley, Yazoo County: Hassie Hunt 4 J. O. Martin, NW S¼ 35-10n-3w, Woodruff 4,853-63 ft., pumped 27 bbl. hourly, 4,900 ft., T.D.

M. Carl Jones 3 Walker, SW NE SE 2-9n-3w, Woodruff 4,935-58 ft., pumped 26 bbl. hourly, 4,958 ft., T.D.

Magnolia 12 Mitch Payne, NW S¼ 36-10n-3w, Woodruff 4,742-45 ft., Perry sand 4,985-95 ft., Stevens sand 5,051-60 ft., no show, dry at 5,065 ft.

Roeser & Pendleton 3 Stevens, NW SE 2-9n-3w, Woodruff 4,968-84 ft., pumped 27 bbl. hourly, 4,985 ft., T.D.

Sinclair Wyoming Oil 7 Sorrells, NE SW 29-10n-2w, Woodruff 5,010-59 ft., pumped 419 bbl. in 12 hr., 5,068 ft., T.D.

Sinclair Wyoming Oil 1 McGraw, NE W¼ 36-11n-3w, Tallahatchie 1,500 ft., Wilcox 1,827 ft., Midway 3,941 ft., Selma 4,710 ft., Woodruff 4,895 ft., Perry sand 5,333 ft., Slick sand 5,407 ft., McGraw sand 5,820 ft., perf. casing 5,819-25 ft., flowed 739 bbl. in 24 hr., 5,868 ft., T.D.

Snowden & McSweeney 4 Ven Hanley, NW SE SW SE 35-10n-3w, T.D. 4,872 ft., flowed 28 bbl. in 1 hr.

LEGAL

Department of the Interior, General Land Office, Washington, D. C. Notice is hereby given that the oil and gas deposits in the following lands in the Caddo oil and gas field, Louisiana, are offered to the responsible qualified bidder of the highest bonus per acre, pursuant to the provisions of Section 17 of the leasing act of February 25, 1920 (41 Stat. 437), as amended by the act of August 21, 1935 (49 Stat. 674) at the royalty rate scale in the lease form shown in Circular 1386, at a sale to be held in the Federal Court Room, Post Office Building, Shreveport, Louisiana, at 10:00 o'clock on December 19, 1941: Parcel No. 1—S½ NE¼, W½ SE¼ Sec. 31, T. 20 N., R. 15 W., lot 1 Sec. 25, lots 1 and 3 Sec. 32, lots 1 and 2 Sec. 36, T. 20 N., R. 16 W., 274.27 acres; Parcel No. 2—all, fractional Sec. 20, T. 20 N., R. 16 W., 37.83 acres; Parcel No. 3—lot 3 Sec. 3, lots 3, 4, 5, Sec. 4, lots 5 and 6 Sec. 9, lots 6, 7, 8, 9, 10 Sec. 10, lot 1 Sec. 12, lots 1 and 2 Sec. 15, lot 1 Sec. 16, T. 20 N., R. 16 W., 307.68 acres; Parcel No. 4—SE¼ Sec. 9, E½ SE¼ Sec. 11, N½ SW¼, NW¼ SE¼ Sec. 12, T. 21 N., R. 16 W., 360.46 acres. The successful bidder must deposit on the day of the sale a certified check on a solvent bank, or cash, for one-fifth of the amount of each bid and file the showing of qualifications to receive a lease required by Section 7 of General Land Office Circular 1386. The remaining four-fifths, together with the annual rental in advance at the rate of $1 per acre, must be paid, and a $5,000 corporate surety bond must be furnished, prior to the issuance of the lease. The bidders are warned against violation of the provisions of Section 59 of the United States Criminal Code approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior.

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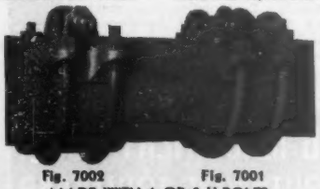

Fig. 7002 Fig. 7001
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CANADIAN FIELDS

Plan Greater Development of Alberta Heavy-Oil Deposits

By VICTOR LAURISTON

CHATHAM, Ont., Nov. 17.—Crude and natural-gasoline from all Alberta fields for the week ending November 3 averaged 26,570 bbl. daily, compared with 27,370 bbl. daily for the previous week and 26,861 bbl. daily for the corresponding week last year. The daily average included 25,481 bbl. of crude and 783 bbl. of natural gasoline from Turner Valley and 306 bbl. of crude from other fields. There were 190 producing wells, with 28 drilling, 3 finished, 6 testing, 1 suspended, 1 abandoned, 3 spudded, and 2 new drilling permits issued.

Vermilion Field

The prospective intensive development of the Vermilion field in East Central Alberta as a source of fuel oil has been held up by demands of leaseholders for high overriding royalties, according to a joint statement by G. B. Webster, assistant federal oil controller, and Dr. G. S. Hume of the Geological Survey of Canada. The transcontinental railways have agreed to take 1,000,000 bbl. of oil next year at $1.15 per barrel, the crude requiring no refining but merely processing to extract silt and water. The Alberta government and the C.P.R. reduced their stipulated royalties by approximately one-half. To date, some 14 wells have been drilled to prove an area 1½ miles long and 1 mile wide, which still allows 50 drilling sites on a 10-acre spacing basis. The Vermilion-Battleview discovery well has been producing 30 bbl. daily from 1,858 ft. since May 13, 1940. Four wells are on the pump, one temporarily off the pump, and two capable of flowing through casing, but lacking production equipment. Vermilion Consolidated Oils, Ltd., is setting up a plant at Borrodaile to process the crude. Recent drilling has, however, been outside the proven area.

Anglo-Canadian 1, LSD 15, 28-49-7w4, west of the field, has been abandoned below 2,279 ft. Anglo-Canadian-Cummings 1, LSD 6, 22-48-7w4, has secured permit. Princeville Petroleum 2, LSD 1, 31-50-5w4, has cemented casing on top of the sand at 1,792 ft. Acme Gas-Oil Selections 2, has drilled in, and is pumping from 70 to 105 bbl. daily. Acme 1, LSD 5, 20-50-5w4, which blew in a large gasser at 1,834 ft., developed difficulties in completion and has been abandoned.

Tar Sand Operations

The Alberta Conservation Board has reported commercial production from the Athabaska tar-sand area near McMurray, where, in September, the Abasand Oils separation and refining plant produced 3,440 bbl. of diesel and fuel oil from 4,027 tons of bituminous sands. Mining of the tar sands was commenced on May 19, and up to the end of September 18,852 tons of sands produced 16,928 bbl. of crude, 1,059 bbl. of gasoline, and 3,479 bbl. of diesel and burner oil. Production is marketed in the north.

Canadian Production

Crude production from all Canadian fields for August totaled 870,881 bbl. compared with 876,845 bbl. in July and 868,651 bbl. in August 1940. The August production included: New Brunswick, 1,893 bbl.; Ontario, 12,901 bbl.; Alberta, 853,563 bbl.; Northwest Territories, 2,524 bbl. Canadian production for the 8 months of 1941 from January to August, inclusive, totaled 8,620,695 bbl. against 5,426,813 bbl. for the same period of 1940.

Natural-gas production from all Canadian fields in August totaled 1,988,729 M. cu. ft. against 1,957,032 M. cu. ft. in July and 1,582,755 M. cu. ft. in August 1940. For the 8 months' period of 1941 the production was 25,281,862 M. cu. ft. compared with 23,319,949 M. cu. ft. in the same period last year.

TURNER VALLEY LIME TESTS

North Turner Valley: Major Oil 3, LSD 1, 8-21-3w5, T.D. 8,120 ft., Madison at 7,655 ft., temporary allowable 748 bbl. daily, fishing for packer between upper and lower zones; when this is recovered will complete acid treatments and test for increased allowable.

Royalite Oil 58, LSD 7, 22-20-3w5, below 7,532 ft., Madison at 7,220 ft.

(Continued on Page 103)

Summary of Operations, All Fields for October

SUMMARY OF OPERATIONS

District—	Comp.	Oil	Prod.	Gas	Dry	Completions Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Footage	Drilling
Appalachian	586	462	673	97	27	21	453	99	13	0	1,270,423	723
Ohio	148	37	951	73	38	46	42	59	1	0	274,344	265
Indiana	47	21	1,422	5	21	19	21	7	0	0	71,458	71
E. Kentucky	32	7	64	22	3	7	14	11	0	0	68,828	115
W. Kentucky	30	13	1,146	1	16	21	9	0	0	0	24,408	41
Michigan	77	46	84,986	8	23	4	41	32	0	0	212,588	168
Illinois	326	249	92,865	2	75	13	136	176	1	0	873,782	393
Kansas	146	82	78,343	9	55	3	29	114	0	0	452,574	237
Nebraska	3	2	930	0	1	0	3	0	0	0	6,319	9
Missouri, Iowa	4	0	0	0	4	3	1	0	0	0	4,526	6
Oklahoma	144	81	17,426	12	51	10	57	62	15	0	438,111	386
North Texas	227	154	28,624	1	72	53	87	75	12	0	515,780	197
W. Central Texas	70	30	4,464	6	34	21	31	18	0	0	91,201	88
N. West Texas	122	118	108,286	0	4	0	3	34	85	0	591,889	122
S. West Texas	120	112	59,049	0	8	1	25	85	9	0	429,579	109
Texas Panhandle	79	70	14,487	8	1	0	6	73	0	0	236,709	72
E. Texas	101	88	14,834	5	8	0	1	87	13	0	437,386	97
E. Texas Border	5	1	50	2	2	0	2	2	1	0	19,085	9
Upper Gulf Coast	96	69	15,922	1	26	0	0	14	79	3	601,372	110
Lower Gulf Coast	87	58	7,078	6	23	0	0	17	70	0	526,937	87
S. Central Texas	27	12	352	0	15	9	10	7	0	1	50,651	38
South Texas	92	44	5,729	4	44	2	33	49	8	0	319,492	51
Southeast New Mexico	20	18	1,064	0	2	7	4	9	0	0	45,543	69
Arkansas	32	17	3,170	2	13	0	3	12	17	0	148,388	29
North Louisiana	107	66	7,937	10	31	9	38	54	6	0	311,200	98
Louisiana Gulf	66	45	11,333	3	18	0	1	10	35	20	545,846	140
Mississippi	36	29	12,716	0	7	0	0	21	15	0	191,346	35
Alabama	3	0	0	0	3	0	2	0	0	1	15,571	2
Georgia	0	0	0	0	0	0	0	0	0	0	0	2
Montana	34	20	2,962	6	8	3	13	18	0	0	78,699	95
Wyoming	10	9	1,856	0	1	3	3	3	1	0	25,075	65
Colorado	2	1	716	1	0	0	0	1	1	0	9,931	44
Utah	0	0	0	0	0	0	0	0	0	0	0	7
N.W. New Mexico	2	1	125	1	0	0	2	0	0	0	3,489	11
California	91	79	45,182	2	10	0	20	30	36	5	470,598	177
Florida	1	0	0	0	1	0	1	0	0	0	1,280	1
Total October	2,973	2,041	624,742	287	645	255	1,091	1,179	418	30	9,364,408	4,169
Total September	3,073	2,141	761,538	274	658	255	1,120	1,285	373	40	9,702,448	4,046
Difference	100	100	136,796	13	13	0	29	106	45	10	338,040	123

APPALACHIAN

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Bradford	275	*275	200	0	0	201
Allegany	149	†149	112	0	0	114
N. Oriskany	4	0	0	2	2	11
Middle dist.	18	16	20	1	1	25
Butler-Armstrong	15	11	26	1	3	8
SW. Penna.	33	1	50	30	2	99
W. Virginia	92	10	265	63	19	265
Ttl. Oct.	586	462	673	97	27	723
Ttl. Sept.	551	437	805	93	21	679
Difference	35	25	132	4	6	44

*Includes 143 water-input wells.
†Includes 77 water-input wells.

OHIO

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Ashland	6	0	0	4	2	6
Athens	14	4	26	7	3	17
Coshocton	5	3	169	2	0	4
Harrison	2	0	0	1	1	4
Hocking	7	0	0	4	3	0
Holmes	3	0	0	1	2	5
Jefferson	2	2	16	0	0	1
Knox	6	1	1	5	0	15
Lawrence	2	0	0	1	1	5
Licking	13	2	60	9	2	18
Lorain	3	0	0	1	2	6
Medina	11	9	33	1	1	14
Meigs	8	0	0	5	3	14
Monroe	5	1	5	4	0	15
Morgan	9	0	0	8	1	9
Muskingum	6	0	0	5	1	17
Noble	12	4	6	5	3	8
Perry	9	6	619	1	2	22
Stark	2	0	0	2	0	9
Tuscarawas	1	0	0	1	0	11
Washington	10	5	16	2	3	18
Wayne	4	0	0	1	3	7
Miscellaneous	8	0	0	3	5	36
Ttl. Oct.	148	37	951	73	38	265
Ttl. Sept.	169	41	1,785	83	45	243
Difference	21	4	834	10	7	22

EASTERN KENTUCKY

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Floyd	9	0	0	9	0	18
Knott	4	0	0	4	0	20
Pike	7	0	0	5	2	44
Johnson	1	0	0	1	0	8
Magoffin	0	0	0	0	0	2
Lee	1	1	3	0	0	1
Powell	4	4	25	0	0	3
Menifee	1	1	25	0	0	0
Martin	5	1	11	3	1	19
Ttl. Oct.	32	7	64	22	3	115
Ttl. Sept.	34	7	86	22	5	89
Difference	2	0	22	0	2	26

WESTERN KENTUCKY

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Breckinridge	2	0	0	0	2	1
Butler	1	1	5	0	0	1
Daviess	5	3	275	0	2	12
Hancock	3	2	25	0	1	2
Henderson	5	3	58	0	2	4
McLean	2	2	600	0	0	2
Muhlenberg	2	0	0	1	1	2
Ohio	7	1	15	0	6	11
Union	2	1	168	0	1	2
Miscellaneous	1	0	0	0	1	4
Ttl. Oct.	30	13	1,146	1	16	41
Ttl. Sept.	36	17	375	0	19	43
Difference	6	4	771	1	3	2

INDIANA

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Bufkin, S.	2	2	60	0	0	4
Cannelburg	3	0	0	0	3	2
Enterprise	1	1	10	0	0	1
Griffin	10	9	581	0	1	12
Hazelton	1	1	250	0	0	2
Heusler	2	2	147	0	0	4
Merom & Raley	2	0	0	0	2	1
New Harmony	1	1	155	0	0	3
Rockport	1	1	16	0	0	0
Siosi	1	1	100	0	0	0
Trenton	2	0	0	2	0	5
Wildcats	10	1	40	2	7	28
Miscellaneous	11	2	63	1	8	9
Ttl. Oct.	47	21	1,422	5	21	71
Ttl. Sept.	41	21	1,747	4	16	72
Difference	6	0	325	1	5	1

MICHIGAN

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Allegan	8	4	600	1	3	20
Arenac	3	2	55	1	0	10
Bay	4	4	740	0	0	8
Clare	4	2	172	2	0	9
Genesee	1	1	12	0	0	3
Gladwin	2	1	250	0	1	3
Isabella	3	0	0	2	1	7
Lake	3	1	1,600	0	2	7
Monroe	2	0	0	0	2	1
Montcalm	1	0	0	1	0	2
Osceola	26	23	72,750	1	2	38
Roscommon	2	2	8,400	0	0	7
Tuscola	1	0	0	0	1	4
Van Buren	7	6	407	0	1	20
Miscellaneous	10	0	0	0	10	29
Ttl. Oct.	77	46	84,986	8	23	168
Ttl. Sept.	107	48	81,673	5	54	165
Difference	30	2	3,313	3	31	3

ILLINOIS

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Albion	2	2	122	0	0	1
Alma	1	1	25	0	0	0
Allendale	8	8	311	0	0	10
Bartelso	1	1	30	0	0	0
Benton	13	13	2,358	0	0	6
Bonpas	1	1	80	0	0	0
Bonpas W.	2	1	5	0	1	0
Bridgeport	2	2	32	0	0	3
Centralia	1	1	6	0	0	0
Clay City	13	11	1,230	0	2	5
Dale	9	9	2,786	0	0	15
Dundas	7	7	1,113	0	0	3
Dupo	1	1	120	0	0	0
Fairfield	1	1	156	0	0	5
Golden Gate	1	1	50	0	0	0
Griffin	4	4	640	0	0	9
Hoodville	2	2	177	0	0	2
Inman	1	1	40	0	0	2
Iron	1	1	77	0	0	1
Johnsonville	72	62	52,604	0	10	45
Keensburg	2	1	403	0	1	0
Louden	21	20	3,976	0	1	18
Maud	1	1	35	0	0	0
Mt. Carmel	8	7	782	0	1	5
Mill Shoals	4	4	1,100	0	0	13
New Harmony	18	18	3,534	0	0	17
New Haven	3	3	176	0	0	2
Noble	1	1	27	0	0	1
N. Benton	1	1	70	0	0	2
N. Boos	1	1	1,184	0	0	5
Omaha	2	1	86	0	1	1
Parkersburg	3	2	2,168	0	1	4
Rising Sun	8	8	543	0	0	3
Roland	9	8	2,544	0	0	14
Rural Hill	11	11	6,348	0	0	47
Russellville	1	0	0	1	0	0
Sailor Springs	1	1	53	0	0	5
Salem	1	1	19	0	0	8
Stokes	2	2	221	0	0	0
Walpole	5	4	1,113	0	1	3
Westfield	2	0	0	1	1	3
Woodlawn	20	19	4,521	0	1	18
Wildcats	54	5	2,000	0	49	92
Miscellaneous	4	0	0	0	4	25
Ttl. Oct.	326	249	92,865	2	75	393
Ttl. Sept.	469	387	149,963	1	81	384
Diff.	143	138	57,098	1	6	9

NEBRASKA

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Dawson	1	1	250	0	0	0
Barada	1	*1	680	0	0	4
Wildcats	1	0	0	0	1	2
Others	0	0	0	0	0	3
Ttl. Oct.	3	2	930	0	1	9
Ttl. Sept.	9	4	1,057	0	5	17
Difference	6	2	127	0	4	8

*Discovery.

KANSAS

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Abbeyville	2	1	14	0	1	0
Ainsworth dist.	4	3	3,412	0	1	4
Albert	1	1	269	0	0	0
Augusta	3	3	39	0	0	0
Bemis	1	1	3,000	0	0	5
Big Creek	3	2	610	0	1	2
Bloomer	5	2	3,081	0	3	2
Burnett	2	2	6,000	0	0	3
Chase	2	2	3,836	0	0	3
Coralena	2	2	3,069	0	0	4
Cunningham	4	4	3,044	0	0	6
Darlen	1	1	784	0	0	0
Dunaway	1	1	20	0	0	0
N. Eastborough	*1	1	35	0	0	0
Eberhardt	1	1	3,000	0	0	1
Eldorado	8	8	560	0	0	3
Fairport	1	1	58	0	0	1
Ferrell	1	1	50	0	0	0
Forest Hills	2	1	1,536	0	1	1
Geneseo	1	1	432	0	0	3
Gorham	2	2	2,989	0	0	1
Graber	1	1	339	0	0	1
Greenvale	1	1	162	0	0	8
Hall-Gurney	6	5	6,473	0	1	11
Henne	1	1	78	0	0	1
Hugoton	3	0	0	3	0	0
Kaths	3	0	0	3	0	0
Keighly	1	1	51	0	0	0
Keller	1	1	20	0	0	1
Kraft-Prusa	3	1	2,955	0	2	3
Laton	2	2	500	0	0	0
Latta	1	1	375	0	0	0
Lost Springs	2	0	0	0	2	6
Macksville	2	0	0	0	2	1
McLouth	3	0	0	2	1	12
Neidenthal	1	1	338	0	0	0
Pawnee Rock	1	1	402	0	0	3
Peace Creek	2	1	3,000	0	1	6
Ray	2	2	6,000	0	0	5
Raymond	1	0	0	0	1	3
Rickard	1	1	535	0	0	1
Shaeffer	1	1	2,946	0	0	0
Silica & W.	5	5	3,063	0	0	9
Stoltenberg	2	0	0	0	2	3
Trapp & W.	7	7	5,420	0	0	5
Vaughn	1	1	85	0	0	0
E. Welch	1	*1	278	0	0	0
Wherry	2	2	450	0	0	1
Zenith	5	3	9,000	0	2	8

Miscellaneous:

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Butler	1	1	35	0	0	3
Greenwood	2	0	0	0	2	6
Marion	1	0	0	1	0	2
Others	8	0	0	0	8	54
Wildcats	24	0	0	0	24	45
Ttl. Oct.	146	82	78,343	9	55	237
Ttl. Sept.	234	169	190,300	9	56	189
Diff.	88	87	112,047	0	1	48

*Discovery.

OKLAHOMA

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Altus	0	0	0	0	0	4
Apache	2	2	4,912	0	0	11
Avoca	2	0	0	0	2	0
N. Bebee	1	1	240	0	0	1
Cement	3	2	165	1	0	8
Centrahoma	1	0	0	1	0	0
Chickasha	1	0	0	1	0	4
E. Cromwell	4	1	2,216	0	3	9
Cumberland	0	0	0	0	0	6
N. & W. Davenport	2	1	100	0	1	7
Depew	1	1	70	0	0	2
Dill	3	2	582	0	1	1
S. Earlsboro	1	1	224	0	0	4
Empire	5	3	371	1	1	2
S. Fitts	1	1	28	0	0	0
Guthrie	0	0	0	0	0	4
Hewitt & W.	4	3	325	0	1	7
Hobart	1	1	201	0	0	2
Hotulke dist.	4	3	1,085	0	1	20
Isom Springs	2	2	55	0	0	0
Knox	2	2	118	0	0	1
S. Konawa	0	0	0	0	0	6
W. Loco	4	1	20	1	2	8
Okla. City	3	3	1,013	0	0	27
N. Okla. City area*	4	4	123	0	0	0
Rusk	4	4	1,727	0	0	0
St. Louis & E. & N.	7	5	1,440	0	2	9
Tecumseh Lake	0	0	0	0	0	4
E. Tecumseh	2	2	177	0	0	5
Velma	2	2	111	0	0	7
Miscellaneous:						
Creek	6	6	265	0	0	15
Jefferson	2	1	40	0	1	4
Le Flore	1	0	0	1	0	3
Lincoln	4	*2	153	*2	0	4
Muskogee	3	2	35	0	1	9
Okfuskee	2	1	10	0	1	14
Okmulgee	7	2	55	2	3	18
Osage	14	*13	1,355	0	1	17
Seminole	5	1	53	*1	3	11
Tulsa	7	4	157	1	2	14
Wagoner	2	2	20	0	0	7
Others	6	0	0	0	6	51
Wildcats	19	0	0	0	19	60
Ttl. Oct.	144	81	17,426	12	51	386
Ttl. Sept.	194	122	25,430	14	58	383
Diff.	50	41	8,004	2	7	3

*Discovery included.

NORTH CENTRAL TEXAS

NORTH TEXAS

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Antelope	6	5	2,720	0	1	3
Anzac-Graham	1	1	85	0	0	1
Bowers	1	1	84	0	0	1
Briar Creek	3	1	62	0	2	2
Bryson	3	3	221	0	0	2
Clingensmith	2	2	1,950	0	0	1
Coleman	2	2	1,650	0	0	4
Electra-Ellenburger	2	2	440	0	0	2
Fargo	5	5	702	0	0	3
Griffin	2	2	525	0	0	4
Hull-Silk	2	1	52	0	1	9
K.M.A. & Deep	34	34	12,148	0	0	27
Mathis	1	1	400	0	0	4
Nocona	3	2	13	0	1	2
Ross	1	1	700	0	0	1
Sewell	4	3	970	1	0	2
S. Mankins	1	1	125	0	0	1
T.C.U.	4	4	58	0	0	3
Voth	3	2	50	0	1	1
Walnut Bend	1	1	250	0	0	4
Wildcats*	16	5	711	0	11	28
Unlisted fields	0	0	0	0	0	8
Misc. fields:						
Archer	27	18	1,653	0	9	12
Baylor	2	0	0	0	2	2
Clay	36	22	962	0	14	16
Cooke	8	4	51	0	4	5
Jack	5	2	8	0	3	7
Montague	0	0	0	0	0	3
Throckmorton	7	4	180	0	3	4
Wichita	23	13	286	0	10	12
Wilbarger	3	2	60	0	1	5
Young	19	10	1,508	0	9	18
Subtotal	227	154	28,624	1	72	197

*Panhandle-Allar, Young. Kerlyn-Hazelton, Young, Anderson-Orsburn, Cooke. Kemrow-Burnett, Wichita. Kerlyn-Taylor, Young.

WEST CENTRAL TEXAS

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Akard	3	3	311	0	0	3
Albany	2	2	13	0	0	1
Brownwood (gas)	3	1	25	2	0	2
Bluff Creek	2	1	48	0	1	1
Carbon	2	1	7	0	1	1
Cook	3	3	204	0	0	2
Crosscutt	2	0	0	0	2	1
Echo	2	1	209	0	1	1
Loving	2	2	700	0	0	2
Nail	1	1	300	0	0	1

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Noodle	1	1	7	0	0	2
Novice	2	2	720	0	0	2
Pottsville (gas)	2	0	0	2	0	1
Sayles	1	1	159	0	0	1
Stroud	1	1	128	0	0	1
View	2	0	0	1	1	1
Wimberly	3	3	950	0	0	5
Wildcats*	23	1	216	1	21	38
Unlisted fields	4	0	0	0	4	16
Misc. fields:						
Shackelford	9	6	467	0	3	6
Subtotal	70	30	4,464	6	34	88
Ttl. Oct.	297	184	33,088	7	106	285
Ttl. Sept.	227	137	25,822	4	86	250
Difference	70	47	7,266	3	20	35

*States-Wilson, Coleman County (Silver Valley pool). States-Hughes, Coleman County (gas).

WEST TEXAS

NORTHERN WEST TEXAS

Cedar Lake	2	2	1,404	0	0	1
Iatan	3	3	995	0	0	3
Emma	4	4	4,536	0	0	2
Northwest	4	4	779	0	0	2
Seminole	9	9	5,209	0	0	7
Sharon Ridge	2	0	0	0	2	2
Slaughter	75	75	85,112	0	0	62
Wasson	21	21	10,251	0	0	16
Wildcats	2	0	0	0	2	14
Misc. fields	0	0	0	0	0	13
Subtotal	122	118	108,286	0	4	122

SOUTHERN WEST TEXAS

Abell	6	6	7,555	0	0	5
Crockett	2	2	164	0	0	1
Emperor	2	2	801	0	0	1
Dune	1	1	347	0	0	1
Estes	1	1	397	0	0	1
Foster	4	4	2,578	0	0	3
Goldsmith	5	5	3,828	0	0	3
Johnson	12	12	13,021	0	0	10
Jordan	4	3	1,910	0	1	2
Keystone	12	12	3,481	0	0	8
Lehn	3	3	239	0	0	1
McCamey	5	5	1,506	0	0	3
McElroy	4	4	1,578	0	0	2
Magnolia-Sealy	1	1	325	0	0	1
N. Cowden	12	11	4,959	0	1	7
Noelke	4	3	1,155	0	1	3
N. Ward	4	4	2,849	0	0	2
Scarborough	1	1	226	0	0	1
S. Ward	3	3	2,906	0	0	1
Spencer	1	1	717	0	0	0
Sand Hill	7	7	3,304	0	0	5
Tobarg	1	1	50	0	0	2
Taylor Link	3	3	718	0	0	3
Todd Deep	2	2	171	0	0	3
University	1	1	240	0	0	1
Waddell	4	3	2,713	0	1	2
World	4	4	597	0	0	3
White & Baker	6	5	535	0	1	4
Yates	1	1	155	0	0	1
Wildcats*	4	1	24	0	3	14
Misc. fields	0	0	0	0	0	15
Subtotal	120	112	59,049	0	8	109
Ttl. Oct.	242	230	167,335	0	12	231
Ttl. Sept.	216	194	151,222	1	21	218
Difference	26	36	16,113	1	9	13

*Fitzpatrick & Slack-Wilson, Ward County.

TEXAS PANHANDLE

Carson	2	2	327	0	0	5
Gray	29	28	5,260	0	1	21
Hutchinson	35	35	7,927	0	0	32
Potter	1	0	0	1	0	1
Moore	5	0	0	5	0	5
Sherman	1	0	0	1	0	0
Wheeler	6	5	973	1	0	8
Ttl. Oct.	79	70	14,487	8	1	72
Ttl. Sept.	76	71	13,600	4	1	74
Difference	3	1	887	4	0	2

EAST TEXAS

East Texas field (hourly prod.):						
Longview	15	15	687	0	0	13
Kilgore	20	20	846	0	0	14
Joiner	4	4	190	0	0	4
Cayuga	1	1	105	0	0	2
Grapeland	1	0	0	1	0	1
Hawkins	36	35	11,480	1	0	25
Long Lake	7	5	414	2	0	5
Long Lake, E.	1	1	85	0	0	2
Mexia	1	1	2	0	0	1
Pleasant Grove	2	1	10	0	1	1
Richland	1	1	47	0	0	0
Talco	4	3	760	0	1	2
Willow Springs	1	0	0	1	0	1
Wildcats*	7	1	208	0	6	12
Misc. fields	0	0	0	0	0	14
Ttl. Oct.	101	88	14,834	5	8	97
Ttl. Sept.	87	66	12,775	0	21	88
Difference	14	22	2,059	5	13	9

*Sun-Sanders, Smith County, 2 mi. SW of Chapel Hill.

UPPER GULF COAST

Anahuac	3	2	1,365	0	1	1
Barbers Hill	2	2	467	0	0	1
Conroe	1	1	422	0	0	1
Dickinson	1	1	189	0	0	1
Dyersdale	4	3	923	0	1	2
Esperson	1	1	196	0	0	3
Fannett	1	1	669	0	0	0
Fig Ridge	2	1	397	0	1	3
Ganado	3	3	576	0	0	2
Hull	2	2	724	0	0	3
La Belle	1	1	429	0	0	0
League City	1	1	164	0	0	1
Lolita	8	7	1,743	0	1	5
Lovells Lake	3	3	177	0	0	4
Magnet	3	2	145	0	1	1
Magnolia	1	1	87	0	0	1
Martha	1	1	106	0	0	0
Maurbro	3	3	792	0	0	3
Oyster Bayou	1	1	862	0	0	1
N. La Ward	2	2	532	0	0	8
N. Markham	2	2	493	0	0	2
Orange	1	1	124	0	0	2
Old Ocean	2	2	815	0	0	2
Pierce Jct.	1	1	212	0	0	0
Port Neches	1	1	106	0	0	1
Segno	1	1	40	0	0	1
Spanish Camp	1	0	0	1	0	0
Van Vleck	1	1	203	0	0	1
W. Ganado	4	4	490	0	0	4
W. Columbia	1	1	335	0	0	2
W. Ranch	11	11	1,491	0	0	7
Withers	5	5	648	0	0	7
Miscellaneous	21	0	0	0	21	40
Ttl. Oct.	96	69	15,922	1	26	110
Ttl. Sept.	92	65	12,322	5	23	128
Difference	3	4	3,600	4	3	18

LOWER GULF COAST

Agua Dulce	13	10	1,148	3	0	15
Ben Bolt	1	1	320	0	0	2
Clara Driscoll	1	1	135	0	0	1
Coleto Creek	1	1	34	0	0	2
Cologne	1	0	0	0	1	3
E. Flour Bluff	3	2	201	0	1	2
Fagan	3	3	259	0	0	3
La Gloria	3	3	588	0	0	3
Midway	3	1	127	0	2	3
Premont	2	2	61	0	0	0
Minnie Bock	7	4	245	0	3	3
N. McFaddin	2	0	0	2	0	2
Odem	2	2	306	0	0	2
Orange Grove	2	2	210	0	0	1
Petronilla	1	1	43	0	0	1
Placedo	1	1	132	0	0	0
Plymouth	3	2	222	0	1	2
Richard King	3	3	166	0	0	2
Refugio	4	4	359	0	0	2
Saxet	1	0	0	0	1	1
Seeligson	3	3	276	0	0	3
Shield	1	1	20	0	0	0
Stratton	7	7	697	0	0	9
Tom O'Connor	2	2	1,248	0	0	1
Victoria	2	1	87	1	0	2
Wade City	2	1	196	0	1	1
Miscellaneous	13	0	0	0	13	21
Ttl. Oct.	87	58	7,078	6	23	87
Ttl. Sept.	55	41	5,970	3	11	90
Difference	32	17	1,108	3	12	3

SOUTH TEXAS

Alta Mesa	2	2	-168	0	0	1
Benavides	1	0	0	0	1	0
Boyle	1	0	0	0	1	0
Casa Blanca	1	0	0	0	1	1
Charamousca	1	0	0	0	1	0
Chiltipin	1	0	0	1	0	0
Colorado	10	9	1,435	0	1	3
Driscoll	1	1	276	0	0	1
Glen	1	0	0	0	1	0
Hoffman	2	1	40	0	1	1
Jacob	2	2	42	0	0	1
Kelsey	6	6	1,039	0	0	3
Killam	4	4	206	0	0	1
La Reforma	1	1	86	0	0	0
Lopeno	1	0	0	1	0	0
Lundell	3	1	20	0	2	1
Nichols	3	2	164	0	1	1
N. Rincon	1	0	0	0	1	0
Piedra De Lumbre	7	1	110	1	5	1
Palangana	1	0	0	0	1	0
Randado	1	0	0	1	0	0
Rincon	6	5	720	0	1	3
Sejita	1	1	130	0	0	1
S. White Ck.	2	2	810	0	0	2
Sun	2	2	161	0	0	2
S. Calliham	1	0	0	0	1	0
S. Campana	1	1	150	0	0	2
Tarancahuas	2	0	0	0	2	0
White Creek	1	1	10	0	0	0
Yturria	2	2	162	0	0	1
Miscel.	23	0	0	0	23	25
Ttl. Oct.	92	44	5,729	4	44	51
Ttl. Sept.	78	44	4,907	3	31	66
Difference	14	0	822	1	13	15

SOUTH CENTRAL TEXAS

Bee Creek	1	1	150	0	0	1
Chicon Lake	1	1	1	0	0	0
Elgin	1	0	0	0	1	1
Floresville	1	1	2	0	0	0
Gas Ridge	4	4	9	0	0	1
Minerva-Rockdale	2	0	0	0	2	0
Tenney Ck.	6	5	190	0	1	1
Washburn	1	0	0	0	1	0
Miscel.	10	0	0	0	10	34
Ttl. Oct.	27	12	352	0	15	38
Ttl. Sept.	32	17	915	5	15	36
Difference	5	5	563	0	0	2

ARKANSAS

Atlanta	1	1	487	0	0	1
Buckner	2	2	410	0	0	1
Columbia	1	1	275	0	0	1
Dorcheat	1	1	185	0	0	4
E. El Dorado	1	1	28	0	0	2
E. Schuler	2	1	336	0	1	1
Fouke	2	1	82	0	1	1
Macedonia	1	0	0	1	0	1
McKamie	2	0	0	1	1	3
Smackover	3	1	58	0	2	2
Stephens	6	4	620	0	2	2
Troy	1	1	24	0	0	1
Urbana	3	2	450	0	1	1
Wildcats	6	1	215	0	5	6
Misc. fields	0	0	0	0	0	2
Ttl. Oct.	32	17	3,170	2	13	29
Ttl. Sept.	12	6	468	1	5	23
Difference	20	11	2,702	1	8	6

MISSISSIPPI

Tinsley	33	28	12,670	0	5	23
Wildcats	3	1	46	0	2	9
Misc. fields	0	0	0	0	0	3
Ttl. Oct.	36	29	12,716	0	7	35
Ttl. Sept.	25	19	9,526	1	5	34
Difference	11	10	3,190	1	2	1

ALABAMA

Wildcats	3	0	0	0	3	2
Ttl. Oct.	3	0	0	0	3	2
Ttl. Sept.	1	0	0	0	1	4
Difference	2	0	0	0	2	2

FLORIDA

Wildcat	1	0	0	0	1	1
Ttl. Oct.	1	0	0	0	1	1
Ttl. Sept.	0	0	0	0	0	1
Difference	1	0	0	0	1	0

NORTH LOUISIANA

Bellevue	7	6	118	0	1	4
Caddo	23	21	2,454	0	2	10
Converse	1	0	0	0	1	1
Cypress Bayou	1	0	0	0	1	1
Kelly	1	0	0	0	1	0
Little Creek	13	11	1,392	0	2	7
Monroe	7	0	0	7	0	4
Nebo	17	13	1,964	0	4	11
Olla	9	7	972	0	2	15
Pleasant Hill	1	0	0	0	1	0
S. Olla	3	2	120	0	1	2
Sligo	3	2	542	0	1	1
Sugar Creek	1	0	0	1	0	1
Trout Creek	2	1	207	0	1	1
Urania	2	2	63	0	0	1
Waskom	1	0	0	1	0	1
Zwolle	1	1	96	0	0	1
Wildcats	14	0	0	1	13	28
Misc. fields	0	0	0	0	0	9
Ttl. Oct.	107	66	7,937	10	31	98
Ttl. Sept.	85	57	5,449	7	21	96
Difference	22	9	2,488	3	10	3

EAST TEXAS BORDER

Bethany	1	0	0	1	0	0
Carthage	1	0	0	1	0	1
Pine Island	1	0	0	0	1	2
Wildcats	2	1	50	0	1	4
Misc. fields	0	0	0	0	0	2
Ttl. Oct.	5	1	50	2	2	9
Ttl. Sept.	3	1	17	0	2	8
Difference	2	0	33	2	0	1

LOUISIANA GULF COAST

Anse La Butte	5	3	329	0	2	7
Bateman Lake	1	0	0	1	0	1
Bayou Blue	2	1	124	1	0	2
Bayou Des Allemands	1	1	296	0	0	0
Bayou Sale	1	1	844	0	0	3
Bay St. Elaine	1	1	252	0	0	1
Chacahoula	2	1	203	0	1	3
Choctaw	1	1	135	0	0	0
Darrow	1	0	0	0	1	0
E. Hackberry	2	1	178	0	1	3
Edgerly	2	0	0	0	2	1
Erath	3	2	758	0	1	3
Eola	1	1	157	0	0	1
Golden Meadow	2	2	231	0	0	2
Grand Bay	1	1	381	0	0	1
Horseshoe Bayou	1	0	0	1	0	0
Jennings	1	1	25	0	0	2
Lafitte	1	1	270	0	0	1
Lake Hermitage	1	0	0	0	1	0
Lake Long	1	1	715	0	0	1
Leeville	1	1	776	0	0	0
New Iberia	1	0	0	0	1	3
N. Crowley	1	1	129	0	0	1
Paradis	1	1	486	0	0	3
Pecan Lake	1	1	16	0	0	1
Pine Prairie	2	2	542	0	0	4
Point Au Fer	1	1	24	0	0	0
Port Barre	3	2	398	0	1	1
Potash	1	1	584	0	0	1
Roanoke	1	1	162	0	0	1
Richle	1	0	0	0	1	1
Section 28	1	0	0	0	1	1
St. Gabriel	4	4	866	0	0	4
Schooner Bayou	1	1	303	0	0	1
S. Crowley	1	0	0	0	1	0
Stella	1	1	153	0	0	1
Ville Platte	4	4	782	0	0	14
Vinton	1	1	117	0	0	1
Welsh	1	1	146	0	0	2
W. Bay	1	1	487	0	0	2
W. Hackberry	1	1	405	0	0	3
Westwego	1	1	59	0	0	1
Miscel.	4	0	0	0	4	62
Ttl. Oct.	66	45	11,333	3	18	140
Ttl. Sept.	81	56	14,662	1	24	139
Difference	15	11	3,329	2	6	1

SOUTHEAST NEW MEXICO

Barber	1	1	100	0	0	0
Eddy	12	11	675	0	1	36
Lea	7	6	289	0	1	33
Ttl. Oct.	20	18	1,064	0	2	69
Ttl. Sept.	13	11	1,130	1	1	68
Difference	7	7	66	1	1	1

COLORADO

W. Hiawatha	1	0	0	1	0	0
Wilson Ck.	1	1	716	0	0	1
Miscel.	0	0	0	0	0	43
Ttl. Oct.	2	1	716	1	0	44
Ttl. Sept.	1	0	0	0	1	39
Difference	1	1	716	1	1	5

WYOMING

Circle Ridge	1	1	191	0	0	0
Cole Creek	2	2	200	0	0	2
La Barge	1	1	140	0	0	4
Lance Creek	1	1	170	0	0	1
Maverick Springs	1	1	920	0	0	2
Oregon Basin	1	1	220	0	0	3
Osage	3	2	15	0	1	6
Miscel.	0	0	0	0	0	47
Ttl. Oct.	10	9	1,856	0	1	65
Ttl. Sept.	17	9	2,096	1	7	64
Difference	7	0	240	1	6	1

MONTANA

Bowdoin	2	0	0	2	0	24
Bowes	1	0	0	0	1	0
Box Elder	1	0	0	1	0	1
Cut Bank	16	15	2,677	0	1	24
Frannie (Montana side)	1	1	35	0	0	0
Grassy Butte	1	0	0	1	0	0
Kevin-Sunburst	11	4	250	2	5	22
N. Pendroy	1	0	0	0	1	0
Miscel.	0	0	0	0	0	24
Ttl. Oct.	34	20	2,962	6	8	95
Ttl. Sept.	27	16	2,584	5	6	96
Difference	7	4	378	1	2	1

NORTHWEST NEW MEXICO

Fulcher Basin	1	0	0	1	0	2
Hospah	1	1	125	0	0	1
Miscel.	0	0	0	0	0	8
Ttl. Oct.	2	1	125	1	0	11
Ttl. Sept.	2	0	0	2	0	11
Difference	0	1	125	1	0	0

CALIFORNIA

Belridge, N.	0	0	0	0	0	3
Coalinga	4	4	7,425	0	0	8
Coles Levee	2	1	596	0	1	3
Coyote, E.	1	1	406	0	0	2
Coyote, W.	0	0	0	0	0	1
Dominguez	3	3	810	0	0	3
Dyer Creek	1	1	184	0	0	1
Edison	1	1	48	0	0	1
Elk Hills	1	1	255	0	0	3
Elwood	1	0	0	1	0	0
Greeley	2	2	1,689	0	0	6
Helm	1	1	260	0	0	0
Huntington Beach	5	5	1,607	0	0	4
Inglewood	4	3	4,720	0	1	4
Jacalitos	1	1	128	0	0	0
Kern River	2	2	115	0	0	6
Kettleman N. Dome	0	0	0	0	0	9
Long Beach	1	1	125	0	0	2
Midway-Sunset	2	2	213	0	0	3
Mountain View	0	0	0	0	0	1
Mount Poso	10	10	1,934	0	0	4
Paloma	0	0	0	0	0	1
Potrero	0	0	0	0	0	1
Raisin City	1	1	410	0	0	1
Rincon	0	0	0	0	0	2
Rio Bravo	1	1	1,564	0	0	4
Rio Vista	0	0	0	0	0	3
Rosecrans	1	1	125	0	0	0
Round Mountain	1	1	200	0	0	1
San Miguelito	1	1	106	0	0	1
Santa Maria	0	0	0	0	0	3
Santa Maria Valley	5	5	4,065	0	0	12
Seal Beach	0	0	0	0	0	1
Shafter	1	1	488	0	0	1
Strand	1	1	3,692	0	0	0
Ten Section	2	2	861	0	0	3
Torrance	1	1	120	0	0	2
Tupman	3	2	3,740	1	0	4
Turnbull Canyon	1	1	225	0	0	0
Union Avenue	1	1	140	0	0	0
Ventura Avenue	3	3	4,114	0	0	9
Ventura-Newhall	2	2	2,247	0	0	18
Whittier	0	0	0	0	0	1
Wilmington	16	16	3,020	0	0	13
Wildcats	8	0	0	0	8	32
Ttl. Oct.	91	79	45,182	2	10	177
Ttl. Sept.	96	76	43,307	4	16	176
Difference	5	3	1,875	2	6	1

MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1941 High	1941 Low	Week ended Nov. 15 High	Low	Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1940	Com. sh. earn. 1939	1940 High	1940 Low	1939 High	1939 Low
63½	44	58¼	58¼	58¼	Amerada Corp.	788,675	N.P.	50cQ	10-31-41	$2.00	$2.25	$1.56	58½	38½	74½	50
26⅞	19½	27¼	26⅝	27	Atlantic Refining	2,663,999	$25	$1.25†	12-15-41	1.00	2.11	1.66	27⅛	18¼	24⅜	18⅛
13⅛	7	11¾	10⅞	11¼	Barber Asphalt Co.	390,223	$10	25c	5-21-40	.50	—.48	1.39	16⅝	8½	21	10¼
10½	7⅝	9⅜	8⅞	9	Barnsdall Oil Co.	2,558,779	$5	15c	12-8-41	.60	.97	.76	13⅜	7⅛	19½	11⅛
6½	5¼	6¼	6	6	Consolidated Oil Corp.	13,751,726	N.P.	12½cQ	11-15-41	.72½	.28	.55	8⅛	5½	9⅞	6½
27⅛	17⅝	26½	25¼	26	Continental Oil of Delaware	4,682,572	$5	25cQ	9-29-41	1.00	.92	1.35	25	16⅛	31½	19⅞
5	3½	4⅛	3¾	3¾	Houston Oil	1,098,618	$25	....	10-17-30	....	.30	.43	6⅞	3⅜	9⅜	4½
13⅜	9⅝	11⅞	11	11⅛	Lion Oil Refining	435,815	N.P.	25cQ	10-15-41	1.00	1.05	1.50	14⅜	9	18⅛	10
17⅞	13	16⅞	16	16¾	Mid-Continent Petroleum	1,857,912	$10	75c	12-1-41	.80	1.60	1.42	17⅝	11½	18	11⅜
14⅜	9⅜	14½	13⅞	14¼	Mission Corporation	1,378,645	$10	60c	10-16-41	.25	1.01	.87	11¾	7⅛	14⅞	8¾
7⅞	4¼	7⅜	6½	6⅝	National Supply	1,155,517	$10	....	12-22-37	....	—.49	—.87	9¾	4⅝	15½	5⅝
10	6¾	8⅝	8⅜	8⅝	Ohio Oil Co.	6,563,377	N.P.	25c	12-15-41	.45	1.02	—.10	8¾	5⅜	10½	6
9¾	5½	7⅝	7¼	7½	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	....	—.21	.81	8⅞	5½	11⅞	7
10½	7¼	..	..	..	Pan American Pet. Trans.	4,702,945	$5	25c	12-21-40	.25	1.20	1.10	10½	6⅜	8⅜	5
46	35⅜	45⅜	44¼	44⅝	Phillips Petroleum	4,449,052	N.P.	†75c	11-29-41	2.00	2.60	2.21	41⅜	27⅛	46½	31¼
17	14¼	16¼	15⅜	16⅛	Plymouth Oil Co.	1,038,633	$5	30c	9-30-41	‡1.30	1.38	2.38	22⅜	15	24	17⅛
11	7	10½	10	10⅜	Pure Oil Co.	3,982,031	N.P.	50c	12-1-41	.25	1.21	1.11	11½	6⅜	11⅜	6⅛
12⅛	7¼	10½	10⅛	10¼	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-40	.50	.95	.65	9¼	5⅞	10¼	6⅝
17	12½	14⅛	13¾	14	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	9-15-41	1.00	1.05	1.40	20	11	24⅜	15½
15⅜	10⅛	15½	14½	15¼	Shell Union Oil	13,070,625	N.P.	40c	7-21-41	.75	1.05	.77	13⅛	7⅝	17¼	9⅞
35¼	18⅞	34¾	33	33⅛	Skelly Oil	995,349	$15	$1.00	12-18-41	1.25	3.28	1.99	23¼	12¼	29½	15½
10⅜	8¼	10¼	9⅝	10⅛	Socony-Vacuum	31,206,071	$15	25cSA	9-15-41	.50	1.17	1.10	12½	7⅛	15⅛	10¾
25⅛	17⅞	25⅝	24⅛	24½	Standard Oil of California	13,003,953	N.P.	†65c	12-15-41	1.00	1.73	1.38	26⅛	16¼	33⅝	24¼
34⅛	25½	34⅛	31¾	32⅞	Standard Oil (Indiana)	15,272,020	$25	50c†	12-15-41	1.50	2.20	2.23	29	20¾	30	33¾
45⅝	33	45½	42¾	43⅝	Standard Oil of New Jersey	27,280,998	$25	1.50†	12-15-41	1.75	4.54	3.26	46½	29⅞	53½	38
48½	34¼	41⅞	40½	41¼	Standard Oil of Ohio	753,740	$25	$1.00†	12-15-41	2.00	7.44	6.64	41¾	26¼	32¾	17
60½	50	59½	58½	59	Sun Oil	2,434,863	N.P.	25cQ	12-15-41	*1.00	3.03	2.74	65⅞	46¾	66	45¾
2⅝	1⅝	1⅝	1½	1½	Superior Oil Corp.	1,388,979	$1	10c	12-28-40	.10	.11	.04	2½	1⅛	3⅝	1⅜
44¾	34½	45	44	44	Texas Corp.	10,876,139	$25	50cQ	10-1-41	2.00	2.90	3.02	47⅝	33	50¾	32½
4⅛	2⅞	2⅞	2⅝	2⅝	Texas Gulf Producing Co.	888,147	N.P.	10c	6-14-41	.20	.63	.69	4¼	2½	5⅜	3¾
7¾	5¼	6⅝	6⅜	6⅜	Texas Pacific Coal & Oil	888,236	$10	10c	12-1-41	.40	.54	1.00	8⅝	5⅜	11⅜	7
11¼	9⅜	10⅞	10⅜	10⅞	Tide Water Associated	6,371,827	$10	25c†	12-1-41	.70	1.14	1.05	12	8¾	14¼	9½
16	12¾	14⅞	14½	14⅞	Union Oil Co. of California	4,666,270	$25	25c	11-10-41	1.00	.99	1.25	17½	17	19¾	15⅛
31	25	26⅜	26¼	26⅛	Union Tank Car Co.	1,177,381	N.P.	50c	12-1-41	1.75	2.22	2.07	29⅞	22¾	24¼	20⅛
2⅜	1⅝	2⅛	2	2⅛	Wilcox Oil & Gas	470,768	$5	10c	2-15-40	....	.35	.77	3⅝	1¾	4¼	2⅜

*Also 5 per cent in stock. †Includes extras. Also 2 per cent in stock. —Deficit.

New York Curb Exchange

1941 High	1941 Low	Week ended Nov. 15 High	Low	Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1940	Com. sh. earn. 1939	1940 High	1940 Low	1939 High	1939 Low
⅝	¼	⅞	¼	¼	American Maracaibo Co.	1,778,415	$1	....	.....	....	—$0.04	—$0.05	⅜	¼	1¼	¼
8¼	5⅛	7	6½	6⅞	American Republics Corp.	1,308,049	$10	10c	7-10-41	....	.78	.14	10⅜	4½	11⅜	5½
2½	1	2	1⅞	1⅞	Bridgeport Machine Co.	263,700	N.P.	$1.25	12-30-37	....	—.88	—.95	3¼	1⅝	7¼	2½
46	36½	..	..	..	Buckeye Pipe Line Co.	200,000	$50	$1	12-15-41	$4.00	5.09	3.13	43	28	34¾	26½
110¼	87	94	94	94	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	9-29-41	6.00	6.33	7.87	117	95	130	108⅝
6⅝	3⅝	3⅝	3½	3½	Cities Service (new)	3,703,978	$10	....	6-1-32	....	1.72	.68	6¾	4	9¼	4¼
2	⅝	1½	1⅜	1⅜	Cosden Petroleum	465,804	$1	....	.....	....	—.34	.15	2⅛	⅝	2¼	½
19¾	12½	18⅛	17¼	17¼	Creole Petroleum	6,974,356	$5	50cSA†	12-15-41	1.00	.98	1.38	24¼	11⅝	28	16¾
9	3¾	8⅛	8⅛	8⅛	Darby Petroleum	351,390	$5	25c	7-15-41	....	1.12	.03	4⅜	2⅞	7⅛	3⅜
2¼	1	1⅞	1⅞	1⅞	Derby Oil & Refining	263,162	N.P.	....	.....	....	.12	—.37	2	¾	2⅝	1½
28¾	20	22½	22	22½	Eureka Pipe Line	50,000	$50	50c	11-1-41	2.25	—.49	.63	31	20¼	23	15⅛
39	29	36⅜	35½	35⅞	Gulf Oil Corp.	9,076,202	$25	75c†	12-15-41	1.25	2.44	1.69	39⅞	25⅛	45⅛	29¼
65	52¾	60⅛	59½	59⅞	Humble Oil & Refining	8,987,840	N.P.	62½c	12-26-41	2.00	3.13	3.33	68	47⅛	71	42½
7⅜	5¾	7	6⅞	7	Imperial Oil of Canada	26,965,078	N.P.	25c	12-1-41	.62½	.65	.71	12⅜	5⅜	17	11⅜
5	2¾	3⅞	3¾	3¾	Indiana Pipe Line	300,000	$7.50	20c	11-15-40	*2.80	.09	.33	7¾	3	7¼	5½
11⅞	8⅞	11¾	11⅛	11½	International Petroleum	14,324,088	N.P.	50c	12-1-41	1.25	.94	1.19	10⅜	8¼	27½	17
2⅝	1⅜	1⅞	1⅞	1⅞	Kirby Petroleum Co.	500,000	$1	10c	3-15-41	....	.16	.06	2¾	1⅝	3¾	2⅛
10⅛	8¼	8½	8⅜	8½	Lone Star Gas	5,518,347	N.P.	20c	8-22-41	.70	1.17	.98	10⅜	7⅝	10½	7⅛
5⅝	4⅛	4¼	4⅛	4⅛	Louisiana Land & Exp.	2,966,762	$1	10c	9-15-41	.35	.29	.22	6¼	3¾	7¾	4
10⅛	9½	10⅛	10⅛	10⅛	Margay Oil Corp.	149,943	N.P.	25cQ	10-10-41	1.00	1.02	1.52	17	9¼	17	14½
4⅛	2½	3⅛	3⅛	3⅛	Middle States Petroleum "A"	291,970	$1	37c	1-31-41	.63	.31	.37	4⅛	2¾	5¾	2¾
8	7	7⅞	7⅛	7⅛	Midwest Oil Co.	998,474	$10	45c	12-15-41	.90	.88	.99	8½	5½	8¾	6⅝
6⅛	5⅛	5½	5¼	5¼	Mountain Producers	1,593,584	$10	30cSA	6-16-41	.60	.58	.70	6¼	4⅞	6	4⅞
12⅜	10⅛	10½	10⅛	10¼	National Fuel Gas	3,810,183	N.P.	25cQ	10-15-41	1.00	1.12	.95	13⅛	10	14	11¼
12⅞	10¼	..	..	..	National Transit	509,000	$12.50	50c	6-16-41	1.00	1.08	.91	12½	8¾	9½	7¼
2¼	1	1¼	1¼	1¼	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.03	.02	1¼	¾	1¾	1
8¼	6⅝	..	..	..	New York Transit	100,000	$5	30c	10-15-41	.60	.91	.88	7¾	5¼	6	4
10	7¾	10⅛	10⅛	10⅛	Northern Pipe Line	120,000	$10	90c	12-1-41	.80	.70	.31	9⅞	6	7	4½
5⅛	2⅝	5⅜	5⅛	5⅜	Pantepec Oil	2,856,872	$1	....	.....	....	.02	....	5½	2½	7⅝	4
3¾	1	2⅞	2⅞	2⅞	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.04	.70	3¼	1	5	1¼
2⅝	2⅛	2⅝	2⅝	2⅝	Ryan Consolidated	298,931	N.P.	10c	12-28-40	....	.43	.16	3	1¼	3	1⅞
8	6½	..	..	..	Southern Pipe Line	100,000	$10	50c	12-11-41	.50	.81	.25	11¾	4¾	4⅞	3½
43½	35⅝	36¾	36⅜	36⅜	South Penn Oil	1,000,000	$25	37½c	9-26-41	2.50	2.10	2.84	44	28	40½	26¾
30½	23	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50c	10-1-41	6.50	3.22	2.06	35	21	23	18
20⅜	17⅞	19	19	19	Standard Oil of Kentucky	2,604,790	$10	25c	9-15-41	1.30	1.47	1.53	20⅞	16½	20⅛	17¼
2¼	1⅜	2⅜	2¼	2¼	Sunray Oil	1,975,876	$1	5c‡	12-19-41	.10	.23	.25	2	1⅜	2⅜	1⅜
3¼	2⅝	3	3	3	Texon Oil & Land	936,024	$2	15c	12-27-41	.40	.45	.49	3⅛	2	4	2⅝
4⅝	2¼	4⅞	4¾	4⅞	Transwestern Oil Co.	750,000	$10	....	.....	....	—.59	—1.42	3⅜	2	6	2⅛
1⅛	½	⅝	¼	⅛	United Gas Corp.	7,818,959	$1	..	.....	....	—.49	—.55	2⅛	⅝	3⅜	1½

*Includes $2.50 capital distribution. †Includes extras. —Deficit. ‡Also 5 per cent in stock.

Personal Paragraphs

Two oil families were united last week in New York when Miss Mary Helen Frueauff, daughter of Mr. and Mrs. HARRY D. FRUEAUFF, became the bride of Lt. Charles Thackery Klein, son of Mr. and Mrs. CHARLES KLEIN, of Tulsa. The bride's father is vice president of Cities Service Oil Co., and the bridegroom's father is treasurer of Mid-Continent Petroleum Corp.

JOSEPH A. LA FORTUNE, vice president, Warren Petroleum Corp., Tulsa, has been named to membership on the University of Notre Dame's board of lay trustees. Mr. La Fortune was born and raised in South Bend, Ind., and attended Notre Dame in 1915 and 1916. He began his career in the oil business with Standard Oil Co. of Indiana. He joined Warren Petroleum in 1924 as secretary, and was made vice president in 1929.

TOM H. WALLACE, drilling and production superintendent for Gulf Oil Corp., Houston, Tex., has been transferred to Western Gulf Oil Co. at Bakersfield, Calif.

EUGENE M. PHILPOT, JR., instrument man for Humble Oil & Refining Co., has been appointed civil engineer for the company in the Galveston Bay, Tex., district.

BERT DEVERE, of Pathfinder Oil Co., with offices in Los Angeles, Calif., has returned from Sacramento where he appeared before the state Assembly Committee in behalf of all independent refiners.

STANLEY B. WHITE, assistant chief geologist, Ohio Oil Co., Tulsa, will address the Shawnee (Okla.) Geological Society Thursday night on "The Davenport Pool of Lincoln County."

W. E. HUBBARD, petroleum engineer for Humble Oil & Refining Co., Houston, Tex., returned last week from a hunting trip to New Mexico, where he is reported to have bagged a five-point buck deer.

PAUL DEAN, of Dean Brothers, and president of the Fort Worth, Tex., Geological Society, addressed the members of the society at their weekly luncheon at the Worth Hotel. Mr. Dean discussed the firm's experience in water flooding and secondary recovery in the shallow Woodson pool of southeastern Throckmorton County.

FRANK BUTTRAM, president, I.P.A.A., discussed the oil-price situation at a state regional I.P.A.A. meeting at Oklahoma City, Okla., Tuesday night. H. B. FELL, executive vice president, reported on the annual meeting held recently in Tulsa.

G. E. ARCHIE, Shell Oil Co., Inc., Houston, Tex., delivered a paper on the use of electrical resistivity logs to determine reservoir characteristics before the East Texas section of the American Institute of Mining and Metallurgical engineers last week at the Kilgore Hotel, Kilgore, Tex.

C. R. DODSON, engineer for Standard Oil Co. of California in the San Joaquin Valley, delivered a paper before the A.P.I. meeting at Taft, November 18, titled "P-V-T Relation of Oil and Gas Mixtures," in which he pointed out the importance of phase studies in fields of Paloma type.

L. E. NUGENT, geologist, Texas Co., and RONALD K. DeFORD, district geologist, Argo Oil Corp., both of Midland, Tex., addressed the West Texas Geological Society at a meeting held in Hotel Scharbauer, at Midland. The subject of Mr. Nugent's talk was "Theories of Geomorphic Development," and that of Mr. DeFord was "Highlights of the New Mexico School of Mines Field Trip," which was held November 1-2.

DAN MORAN, president of Continental Oil Co., Ponca City, Okla., had an experience en route to the A.P.I. annual meeting that he wont forget for a long time. Flying from Houston to San Francisco the pilot found visibility at zero and subsequently made a forced landing at Moffett field south of San Francisco. Army officials held Mr. Moran for 2 hours, during which time he was subjected to an investigation and asked to explain why he landed at an army aviation field. He finally convinced the officials and then had to walk to Palo Alto to get a train.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Mason D. Samson, a Salina, Kans., banker, is at the head of a $1,000,000 corporation, it is reported, whose object is to erect a big oil refinery at Augusta, Kans.

Underground concrete storage tanks, wherever used, are regarded by oil men with much favor. Their use will probably become quite general in the years to come.

E. K. Fuller, a driller of Whittier, Calif., has invented a tubing catcher which is said to be a great improvement over other devices used in lifting strings of tubing from wells.

20 YEARS AGO

At Muskegon, Mich., the city is finding it desirable and economical to apply road oil on asphalt pavement. It is said by City Manager Ellison that the road oil, which costs 10 cents a square yard to lay, will preserve the life of the asphalt streets.

Howard V. Thomas, vice president and general manager of the Eastern Oil Co. and president of the West Virginia Central Gas Co., the Maryland Gas Co. and subsidiary companies, died November 12, at Buffalo, N. Y.

A race is on in the western part of both North and South Dakota by the oil companies for acreage.

10 YEARS AGO

Ethyl Gasoline Corp. has announced plans for the marketing of a new product, virtually a second grade of Ethyl gasoline.

East Texas scored its 3,000th well this week.

A new era for the petroleum industry was opened at the twelfth annual convention of the American Petroleum Institute at Chicago last week when the board of directors of the Institute endorsed the principle of equitable and ratable ownership of the recoverable oil and gas in a common pool.

MON E. McMAHON has been made manager of Nicklos Drilling Co., and will make his office at Houston, Tex.

F. W. FLOYD, Standard Oil Co. (New Jersey), sailed last week on the Santa Paula for South America.

WILLIAM E. DASHEM has joined the chemistry laboratory staff of the Harry R. Lewis Co., petroleum industry consultants, Warren, Pa.

H. R. CULLEN, president of Quintana Petroleum Co., Houston, Tex., has been appointed a member of the petroleum committee of the South Texas Chamber of Commerce.

E. K. SCHLUNTZ, engineer, Shell Oil Co., Inc., has been transferred from Tulsa to Wirt, Okla. GALE BILLINGS, Shell engineer at Colorado City, Tex., has been moved to the Healdton, Okla., district.

W. A. MONCRIEF, president, Moncrief Oil Co., Fort Worth, Tex., has been elected a director of the First National Bank of Fort Worth. He is a member of the firm of Showers & Moncrief, and is a director of the Premier Royalty Co.

V. E. COTTINGHAM, chairman of the North Basin Pools Engineering Committee, will address the Petroleum Engineers' Club of Fort Worth, Tex., Friday night, November 21, at the Texas Hotel. His subject will be "Conservation of Oil and Gas."

FRANK SHAFFER, a member of the seismograph crew of the Texas Co. which has been working in the Elk City area of Oklahoma, has been transferred to Corsicana, Tex. Mr. Shaffer is a son of the late Oscar R. Shaffer, the dean of Oklahoma oil scouts when he died.

W. G. SHELBY, president, Shelby Oil & Gas Co., Tulsa, has gone to his winter home at Sarasota, Fla.

JOHN PUGH, independent oil operator, has returned to his home at Centralia, Ill., from Shreveport, La., where he has been in a hospital for several months.

R. L. SMITH, assistant district chief clerk for Humble Oil & Refining Co., has been promoted to district chief clerk in the Hurdle, Tex., district.

C. C. IRBY, petroleum engineer, Turner Petroleum Corp., has been elected chairman of the Michigan chapter of the American Petroleum Institute. Election took place at the annual dinner and elections in Mount Pleasant, Mich., last week.

LLOYD NASH, Tide Water Associated Oil Co., Evansville, Ind., is chairman of the newly organized Civil Protection League. The league will work nationally to have strikes outlawed in defense industries and will urge amendment of the National Labor Relations Act to permit men honorably discharged from military service to obtain employment without payment of union fees.

JOHN W. MELROSE, Olympia, Wash., has been appointed geologist by the Chicago, Milwaukee, St. Paul & Puget Sound Railroad, for the purpose of assisting the mineral development in the states traversed by the road. The road has had relatively little benefit from oil developments since the early days of Cat Creek, when the major production of that field was shipped out of Montana.

J. HOWARD MYERS, supervisor of safety and fire prevention, Atlantic Refining Co., Philadelphia, Pa., opened an industrial accident prevention conference at Shreveport, La., last week with a talk on the function of a safety engineer. Panel discussion which followed was led by BILL GRANT, Humble Oil & Refining Co., Houston, and included W. W. WELDON, Standard Oil Co. of Louisiana, Baton Rouge, La.; C. A. MILLER, Texas Co., Houston, and representatives of other industries.

Gives Tanker Name

The name of John D. Gill which, for years, has been synonomous with searching analytical appraisals of petroleum economics and earlier with technical aspects of the industry, last Saturday was given to Atlantic Refining Co.'s newest tanker.

JOHN D. GILL

Chemistry was the science which directed Mr. Gill into the petroleum industry at a time when technical men made up a small part of the oil companies' personnel. Mr. Gill has been a member of the Atlantic board since 1931.

He was graduated from Towne Scientific School, University of Pennsylvania, with a degree of bachelor of science in chemical engineering. Immediately thereafter he joined the teaching staff of the Pennsylvania Military College and taught physics and industrial chemistry.

In 1912, Mr. Gill entered the employ of Atlantic Refining Co., engaging at the outset of his service in lubrication research. Subsequently, he was appointed director of the control laboratory of the company at Philadelphia, Pa. After completing the organization of this laboratory, he was sent to the Pittsburgh, Pa., refinery as assistant superintendent. His next work was as manager of the personnel and organization department of the sales division with headquarters in Philadelphia. During this period he was an active member of the Society of Automotive Engineers and a member of various committees of trade and engineering organizations identified with the petroleum industry. Best known work by Mr. Gill during this period was his contribution on lubrication principles to Day's Handbook.

In 1937, he served on the petroleum industry committee of the conference on price research sponsored by the National Bureau of Economic Research. He is a member of the American Economic Association, Franklin Institute, Royal Economic Society, and American Statistical Association.

Among Mr. Gill's hobbies is Boy Scout work. He is a member of the executive committee of the Philadelphia Council.

K. W. HALEY, who has been superintendent at Olney, Ill., for Barnsdall Oil Co., has been transferred to Corpus Christi, Tex.

BURR LAMBERT, drilling contractor of Evansville, Ind., has returned from a moose hunt at Metagama, Alta., Canada.

Z. L. PHELPS, independent producer of Coalinga, Calif., has started the drilling of a new well in the old Coalinga area where production has been in progress for nearly 50 years.

W. G. SKELLY, president, Skelly Oil Co., Tulsa, has been elected general chairman to direct a 2-week campaign for a $3,833,000 civic-improvement bond election December 2.

HOWARD S. COLE, JR., manager of the West Texas division of the Texas Co. at Fort Worth, Tex., has been transferred to the Gulf Coast division at Houston, as assistant to L. E. BARROWS, manager of drilling and production department.

GEORGE THOMAS, chief scout for Ohio Oil Co., has been transferred to the home office of the company at Findlay, Ohio. GORDON PRINGLE, of the Michigan State Geological Survey, has been signed on by Ohio to fill the vacancy in the Mount Pleasant, Mich., office.

RAY GENTRY, at one time in the Tulsa crude-oil office of Shell Oil Co., Inc., and who entered the Army some months ago, has been discharged and has resumed his duties with the company. He is temporarily stationed at Pampa, in the Panhandle field of Texas. J. W. ROCHE, who has been at Kansas City, Mo., is now in Tulsa.

N. VAN WINGEN, production engineer for Richfield Oil Corp. at Los Angeles, and Coles Levee, Calif., spoke before the San Joaquin chapter of the A.P.I. on Tuesday evening, November 18, his subject being "Field Determination of Sand Permeabilities." Mr. van Wingen showed how average permeabilities could be measured by flow rates established against various back pressures, using bottom-hole-pressure data.

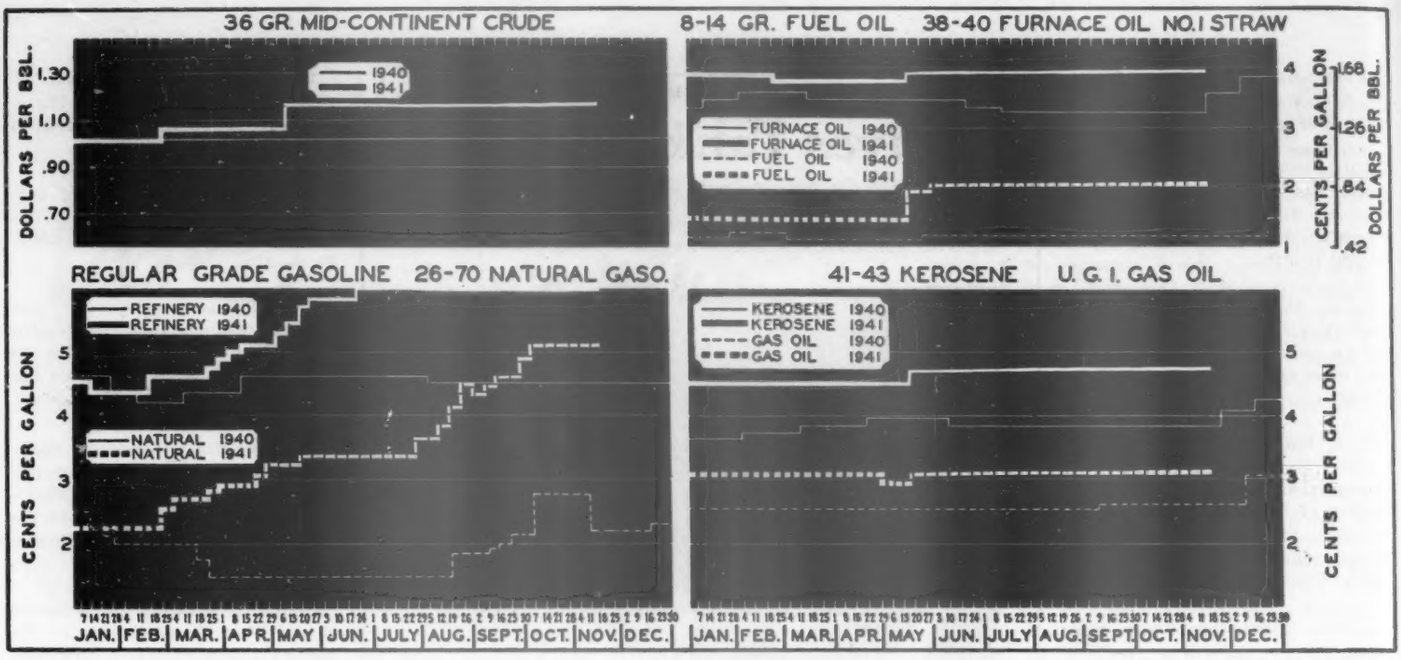
ROBIN WILLIS, consulting geologist, addressed the Los Angeles Basin chapter, American Petroleum Institute, Long Beach, Calif., Tuesday night. His subject was "Some Drilling-Time Logs and Their Uses." H. C. FARQUHAR, manager of purchases, Union Oil Co. of California, spoke on "Priorities and Their Relationship to the Oil Business," at the same meeting.

Shifts: WILLIAM KENNETT, geologist, Superior Oil Co., from San Fernando, Calif., to Santa Paula, Calif.; R. G. DALEY, engineer, Shell Oil Co., Inc., from Pampa, Tex., to Electra, Tex.; W. E. LEROUX, engineer, Carter Oil Co., from Winnfield, La., to Jena, La.; W. H. LAW, superintendent, Jones & Brooks, from Carlyle, Ill., to Belleville, Ill.; E. A. CORNELIUS, superintendent, Taylor Drilling Co., from Centralia, Ill., to Falls City, Neb.; A. J. ROGERS, geologist, Skelly Oil Co., from Cameron, Mo., to Mound City, Mo.; V. T. SMITH, superintendent, F. H. Allen Co., from Hill City, Kans., to Great Bend, Kans.

COL. ERNEST O. THOMPSON, chairman of the Texas Railroad Commission, will be honored at a farewell dinner November 21, upon the occasion of his return to civilian life from military duty. The dinner will be held at officers' mess of the 111th Quartermasters' Regiment. The orders releasing Colonel Thompson by direction of the president were announced at Brownwood, Tex., last Wednesday.

H. F. NELSON, president of Eagle Oil & Refining Co., Whittier, Calif., recently entertained the sales staff at a venison dinner at the Rio Hondo Country Club. J. D. STERLING, vice president of the company, with offices at Santa Fe Springs, Calif., supplied the piece de resistance from a hunting trip a few days before.

FRANK TRAVERS, California independent operator, is receiving condolences upon the untimely death of his daughter who was instantly killed in an automobile accident en route from Stanford University to Los Angeles to attend a football game. Other Stanford coeds in the car were seriously injured when the automobile crashed into the rear of a truck.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Strong Demand Continues Group 3 Refiners in Control of Market

By H. STANLEY NORMAN

ASPECTS of the Mid-Continent refinery market remain essentially unchanged this week. Movement of products to northern markets is at an unprecedented seasonal high, consistent with the general increase in demand. Refiners remain in virtual control of the market. Inquiries continue to exceed supplies of most products that are readily available.

Added this week to the generally strong position of suppliers shipping to northern markets is the improvement in local demand which lagged during the previous 2 or 3 weeks in sympathy with weather conditions that were uninviting to automobile operation.

Natural gasoline continues as one of the strongest products in petroleum markets. A report released late last week showing another substantial draft on stocks during September despite a material gain in production indicates the market trend for natural gasoline. Oklahoma manufacturers reported this week that production is in approximate balance with demand for northern movement. Suppliers, however, are considerably behind demand for natural gasoline manufactured in North Texas, the Panhandle, and at inland Louisiana points.

Natural Short on Coast

Gulf Coast refiners are anxious bidders for additional supplies of natural gasoline. The peak demand for natural gasoline is partially a reflection of the season and to that extent current conditions are normal for the fall and early months of the winter when the percentage blended with refinery motor fuel is substantially higher than during the summer. Still, the over-all increase in demand for motor fuel this year, being higher than even liberal estimates predicted, has taxed the productive capacity of natural-gasoline plants this fall. There is more than ample productive capacity among natural-gasoline plants but a significant percentage is so located that it cannot be utilized because of insufficient raw gas.

Refined Oil Market Barometer

Tendency of petroleum markets to rise above existing levels in several parts of the country is offset by certainty that red tape of price control would make a new position difficult to maintain. Heavy movement to the East Coast has eased the tight supply situation to the extent that buyers again are exercising some influence in the trading. Mild weather in most sections of the country has delayed the distillate market in taking a position for the winter.

MID-CONTINENT: Gasoline demand and tank-car prices steady at prevailing levels.

GULF COAST: Refiners continue to draw motor fuel from inland suppliers.

CALIFORNIA: Residual fuel strong. Refinery gasoline unchanged but tending to soften.

PENNSYLVANIA: Demand for all products strong at unchanged prices.

CHICAGO: Motor-fuel demand firm. Distillate fuels easier.

Distillate fuels are probably the softest of all petroleum products at the moment. Moderate temperatures have prevailed through the early weeks of winter in the northern consuming districts. Jobbers and distributors in many northern cities are operating on stocks accumulated at the end of last winter or during the summer and have not been forced to enter the spot market.

Mid-Continent refiners are not offering distillate fuels extensively under the present set of market conditions. They are relying on experience of past winters in maintaining storage programs until demand takes the slack out of the market. Despite the reluctance of Mid-Continent refiners to force a distillate-fuel market and thereby risk a depression of prices there is a limited volume of material moving at current quotations. While northern jobbers as a group are entering this winter consuming season with stocks at reasonably high levels, there are substantial distributors dependent on week-to-week deliveries.

Demand for tractor distillates has been stimulated slightly during the past few days. Cessation of rains that blanketed a large portion of the Middle West during the last half of October has permitted farmers to resume fall plowing.

Northern Movement Is Brisk

Motor-fuel movement to northern buyers was maintained without noticeable interruption through the 2 or 3-week period of rains, indicating that distributors elected to store supplies available under regular contracts than to risk diversion of materials to other potential customers. Buyers are particularly cautious in their relations with suppliers this fall for the reason that demand is certain to continue upward in 1942 and there is a high value attached to relationships with suppliers.

Prices for regular motor fuel are unchanged at a range of 6 to 6.25 cents per gallon, f.o.b. tank cars at refineries. Most material moved in recent weeks and continuing through the present has been at the high of the quoted range. Movement of gasoline from inland Texas refineries to the Gulf Coast is continuing at a moderate rate but is sufficient to prevent offerings from that base of supplies to the northern market.

Tightness continues in the lubricating-oil market. Refiners are unable to supply all demands for all grades of lubricants, although there is no particular shortage.

Buyers Regain Voice in Eastern Market as Stocks Increase

By J. P. O'DONNELL

NEW YORK, Nov. 18.—The problem of the East Coast area is rapidly changing from one of supply to one of demand. Up to the time of the return of the tankers from British shuttle service and the lifting of consumption restrictions, the principal concern of the industry was its ability to meet the increased demand that was indicated for the fall and winter. Successful solution of the problem even before the return of the tankers built up stocks to the point where they now threaten the maintenance of the price structure.

This is particularly true of heating oils which have been adversely affected by the unseasonably mild weather. Up to the middle of November the highly important metropolitan and suburban New York district had experienced no really cold weather and at only one or two brief intervals have temperatures been down to near-freezing levels. The combination of the light demand and abundant supply has increased East Coast inventories to a point almost 28 per cent greater than they were a year ago.

American Petroleum Institute reports, exclusive of estimated unreported stocks, show that on November 8, this year, gas oil and distillate stocks were up to 22,042,000 bbl. against 17,255,000 bbl. on November 9, 1940. With a smaller increase in demand expected, total stocks during November this year represent more days' supply than they did a year ago. As a result of this situation, doubts have been expressed that prices can be maintained. There have been a few reports of price concessions of a minor nature but low spot-market quotations of major suppliers continue unchanged at 5.3 cents for kerosene or No. 1 fuel oil and at 5.2 cents for No. 2 fuel oil. However, some of the higher spot quotations have been withdrawn while others have been reduced.

The same situation applies to a large extent to residual fuel oil also, though supplies on hand are less than they were at the same time last year. A large proportion of heavy fuel oil is used in heating office and apartment buildings and this proportion has been held well below normal by the continued mild weather. This has resulted in a marked increase in East Coast stocks since the middle of October and also a definite weakness in price particularly in the tank-car market where prices have reportedly been shaded as much as 0.25 cent. Quotations on Bunker C fuel are unchanged.

Prices on other major products continued without change though the maintenance of motor-fuel stocks may eventually bring about some disturbance. Withdrawal of restrictions on gasoline deliveries apparently had comparatively little effect on consumption as has the continued night closing by a large number of stations. Retail prices have given no indication of receding from levels that were put into effect during the emergency and in the tank-car market motor fuel of 72-74 octane continues to be quoted at from 8 to 8.5 cents with a majority of suppliers apparently asking the higher price.

A factor that may tend to ease the currently heavy-inventory position of the East Coast was introduced last week when the Economic Defense Board lifted the embargo on exports of what it termed "low-grade petroleum products" from the Atlantic seaboard. This action extends to Atlantic Coast ports the same regulations now in effect on the Gulf and Pacific coasts. As an explanation, the board said, "Relaxation of this control permits resumption of exportation of certain petroleum products from Atlantic Coast ports to countries to which such shipments had been discontinued during the recent oil emergency in the eastern states."

The export factor has been reduced in importance so far as the East Coast is concerned since the start of the war and in the last month for which data on exports are available, less than 65,000 bbl. of motor fuel were shipped aboard from New York and Philadelphia. In addition more than half of this was described as high-grade fuel which probably could not be included in the "low-grade" exports that are now permissible under the Economic Defense Board ruling. Therefore the change in export regulations is not expected to have any great effect on the East Coast market.

A slight decline in the volume of crude oil and refined products transported to the East Coast by rail during the first full week of November may be taken as an indication that the oil companies are beginning to eliminate much of this high-cost material.

In that week the daily average number of cars dropped to 562 from 584 in the previous week. On the basis of an average load of 225 bbl. per car, this reduced the average daily deliveries by this means to 126,450 bbl. from 131,400 bbl.

The increasing resort to lower cost tanker transportation will have a tendency to weaken prices, thus augmenting the effect of the currently high inventories. If a combination of the various factors involved does result in lower prices the industry may be inviting serious difficulties later. If another transportation shortage would develop and resort to rail transportation again be required, higher prices would be necessary but might be exceedingly difficult if not impossible to obtain under fixed ceilings.

Lend-Lease Buying Maintains Gulf Market's Strong Aspect

HOUSTON, Tex., Nov. 17.—With continued heavy demand by U. S. Navy for gasolines, gas oils, and fuel oils for lend-lease purposes, the spot market for these products on the Gulf Coast is becoming almost nonexistent. Practically all supplies of these products are taken up by this demand, and sellers are finding no occasion to quote on material to spot buyers. Numerous inquiries for these products were being circulated during the week but outside buyers were finding difficulty in getting quotations even for future delivery. Practically all lend-lease bids are on a basis of prices higher than those regularly quoted for spot material, leaving suppliers reluctant to sell at current levels.

The Navy, last week asked bids on 5,000,000 bbl. of fuel oil, 500,000 bbl. of diesel gas oils, and 1,500,000 gal. of 72-octane motor fuel for January delivery. Two separate calls were made for aviation gasoline, one for 3,058,000 bbl. and the other for 5,000,000 gal.

The prices generally being bid for such material, together with limited supplies now available, is practically forestalling the possibility of any early reversal in the spot-market picture.

Early last week it appeared that the market for No. 2 fuel oil, a product not in lend-lease demand and of which there is fairly heavy supply, was breaking. A cargo was sold for 3¾ cents, but the market since has rallied and appears firm at 4 cents minimum.

Bunker C fuel continues to be the main sore spot to suppliers so far as price is concerned.

A.P.I. Weekly Refinery Statistics

Week Ended November 15, 1941

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	19,013,000	11,523,000	22,375,000	649,000
Appalachian	83.8	3,307,000	381,000	657,000	122,000
Ind., Ill., and Ky.	84.4	15,250,000	4,713,000	5,846,000	622,000
Okla., Kans., and Mo.	80.7	7,837,000	2,335,000	2,047,000	300,000
Inland Texas	63.2	2,505,000	1,383,000	472,000	136,000
Texas Gulf	91.0	11,059,000	8,519,000	6,470,000	1,004,000
Louisiana Gulf	94.2	2,610,000	2,171,000	1,741,000	160,000
N. Louisiana and Ark.	49.9	425,000	399,000	399,000	39,000
Rocky Mountains	50.1	1,026,000	279,000	144,000	49,000
California	90.9	15,055,000	63,040,000	13,232,000	557,000
Total reported	86.4	78,087,000	94,743,000	53,383,000	3,638,000
Est. unreported	.....	5,325,000	1,250,000	1,600,000	372,000
*Est. total	.....	†83,412,000	95,993,000	54,983,000	4,010,000
*Est. total previous wk.	.....	82,777,000	95,815,000	54,643,000	3,945,000
*Nov. 16, 1940	.....	79,340,000	105,909,000	47,911,000	3,540,000

*Bureau of Mines. †Includes 7,307,000 bbl. aviation gasoline.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATES)

Week ended November 8, 1941	241,829,000 barrels
Week ended November 1, 1941	243,340,000 barrels
Week ended November 9, 1940	261,931,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of November 18, 1941

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank wag.	Gasoline Dir.	Gasoline tax	Kero. Inc. tank wag.
Chicago, Ill.	16.1	14.1	4.5	10.3
Decatur	15.4	13.4	4.5	9.5
Joliet	16.4	14.1	4.5	10.3
Peoria	16.2	13.7	4.5	10.1
Quincy	13.4	12.4	4.5	10.0
Davenport, Ia.	16.2	14.7	4.5	10.1
Des Moines	15.9	11.9	4.5	9.8
Mason City	16.2	14.7	4.5	10.1
Duluth, Minn.	17.7	16.2	5.5	10.6
Mankato	17.4	15.9	5.5	10.3
Minneapolis	17.4	15.9	5.5	10.3
La Crosse, Wis.	17.4	15.9	5.5	10.3
Green Bay	17.7	16.2	5.5	10.6
Milwaukee	17.6	16.1	5.5	10.5
Detroit, Mich.	15.9	14.4	4.5	9.6
Grand Rapids	15.9	14.4	4.5	9.6
Saginaw	15.9	14.4	4.5	9.6
Evansville, Ind.	16.9	15.4	5.5	9.6
Indianapolis	17.1	15.2	5.5	9.8
South Bend	17.5	16.0	5.5	10.2
Fargo, N. D.	18.4	16.9	5.5	11.3
Huron, S. D.	17.8	16.3	5.5	10.7
Kansas City, Mo.*	14.9	13.4	4.5	9.4
St. Louis*	14.8	13.3	4.5	9.8
St. Joseph	15.7	14.2	4.5	9.6
Wichita, Kans.	14.8	12.7	4.5	8.0

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers. On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off, minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Sept. 18, 1941, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-149 gal., 7.5 cents; 150-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-149 gal., 7.5 cents; 150-399 gal., 7.5 cents; 400 gal. and over 7.0 cents. Stanolex fuel oil A, 1-99 gal., 8.0 cents; 100-399 gal., 7.0 cents; 400-749 gal., 6.0 cents, 750 gal. and over, 5.25 cents. Stanolex fuel oil B, 1-99 gal., 8.0 cents; 100-399 gal., 7.0 cents; 400-749 gal., 6.0 cents; 750 gal. and over 5.25 cents. Stanolex Bunker C fuel oil, 1-399 gal., 6.5 cents; 400-999 gal., 5.5 cents; 1,000 gal and over, 4.5 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Cons'r tank wag.	Gasoline Divided dir.	Gasoline tax	Kero. Inc. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r tank wag.	Gasoline Net dlr.	Gasoline Inc. tax	Kero. tank wag.
Atlanta, Ga.	18.50	18.50	7.5	10.0
Augusta	18.50	18.50	7.5	9.5
Macon	18.50	18.50	7.5	10.0
Savannah	17.50	17.50	7.5	9.0
Birmingham, Ala	19.00	19.00	8.5	9.0
Mobile	19.00	19.00	9.5	8.5
Montgomery	20.00	20.00	9.5	10.0
Jackson, Miss	18.00	18.00	7.5	9.0
Vicksburg	17.50	17.50	7.5	8.5
Jacksonville, Fla.	18.50	18.50	8.5	8.0
Miami	18.50	18.50	9.5	8.0
Pensacola	19.00	19.00	9.5	8.0
Tampa	18.50	18.50	8.5	8.0
Lexington, Ky.	17.50	17.50	6.5	9.0
Covington	16.50	16.50	6.5	9.0
Louisville	17.00	17.00	6.5	8.5
Paducah	15.50	15.50	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons'r tank wag.	Gasoline Dir. tank wag.	Gasoline Inc. tax	Kero. tank wag.
Atlantic City	13.5	14.0	4.5	7.9
Newark	13.5	14.0	4.5	7.9
Annapolis	14.85	15.35	5.5	9.7
Baltimore	14.25	14.75	5.5	8.7
Cumberland	15.65	16.15	5.5	10.2
Washington, D. C.	12.50	13.00	3.5	9.2
Danville, Va.	16.95	17.45	6.5	10.45
Norfolk	15.75	16.25	6.5	10.2
Petersburg	16.05	16.55	6.5	11.2
Richmond	16.05	16.55	6.5	11.2
Roanoke	17.25	17.75	6.5	10.7
Charles'n, W. Va.	17.55	18.05	6.5	11.5
Parkersburg	16.85	17.35	6.5	11.5
Wheeling	16.85	17.35	6.5	11.8
Charlotte, N. C.	18.40	18.90	7.5	9.5
Hickory	18.95	19.45	7.5	10.5
Mount Airy	18.80	19.30	7.0	9.7
Raleigh	18.15	18.65	7.0	10.5
Salisbury	18.45	18.95	7.5	10.9
Charleston, S. C.	17.25	17.75	7.5	(*)
Columbia	18.10	18.60	7.5	(*)
Spartanburg	18.80	19.30	7.5	(*)

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connections, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery: 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline Cons'r tank car	Gasoline Dir. tank wag.	Gasoline Inc. tax	Kero. tank wag.
Philadelphia, Pa.	14.0	15.0	5.5	10.15
Pittsburgh	14.5	15.5	5.5	10.5
Allentown	14.5	15.5	5.5	10.5
Erie	14.5	15.5	5.5	10.5
Scranton	14.5	15.5	5.5	10.5
Altoona	14.5	15.5	5.5	10.5
Dover, Del.	...	15.5	5.5	10.5
Wilmington	...	15.0	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank truck*	Gasoline Serv. sta.	Gasoline tax	Kero. Inc. tank wag.
San Francisco	14.5	18.5	4.5	11.5
Los Angeles	14.0	18.0	4.5	10.0
Fresno, Calif.	15.5	19.5	4.5	12.5
Phoenix, Ariz.	18.5	22.5	6.5	12.5
Reno, Nev.	17.5	21.5	5.5	13.5
Portland, Ore.	17.0	21.0	6.5	13.5
Seattle, Wash.	17.0	21.0	6.5	13.5
Spokane	19.0	23.0	6.5	16.5
Tacoma	17.0	21.0	6.5	13.5

*Posted net tank-truck prices (including tax).

Resale and commercial discounts, effective October 1, 1941: Tank-car deliveries 0.25 cent a gallon off posted net tank truck. Commercial: Retail deliveries, and/or tank-truck deliveries of less than 40 gal., 4 cents per gallon above posted net tank-truck price for Standard Aviation, Standard's Supreme, and Standard Gasoline, and 3 cents per gallon above posted net tank truck for Flight Gasoline, except single deliveries of less than 40 gal. to marine trade only, which are billed at posted net tank-truck price.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Gasoline Inc. tax	Kero. tank wag.
Denver, Colo	14.5	5.5	11.0
Grand Junction	18.0	5.5	12.5
Pueblo	14.5	5.5	9.5
Casper, Wyo.	17.0	5.5	12.0
Cheyenne	16.0	5.5	11.5
Billings, Mont.	18.0	6.5	12.5
Butte	17.0	6.5	13.5
Great Falls	17.0	6.5	12.5
Helena	17.0	6.5	13.0
Salt Lake, Utah	18.5	6.5	14.5
Boise, Idaho	†20.1	6.5	16.5
Twin Falls	†21.1	6.5	17.0
Albuquerque, N. M.	*17.5	7.0	10.0
Roswell	*15.5	7.0	8.5
Santa Fe	‡18.0	7.5	10.0

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Gasoline tax	Kero. tank wag.
Texarkana, Ark.	14.0	5.5	6.0
Fort Smith	15.5	7.0	6.5
Little Rock	17.25	8.0	8.0
Muskogee, Okla.	15.0	7.0	8.0
Oklahoma City	15.0	7.0	8.0
Tulsa	15.0	7.0	8.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons'r tank wag.	Gasoline Dir. tank wag.	Gasoline Inc. tax	Kero. tank wag.
New Orleans, La.	17.25	17.50	8.5	‡10.0
Baton Rouge	17.25	17.50	8.5	‡10.5
Alexandria	17.25	17.50	8.5	‡10.5
Lafayette	17.50	18.00	8.5	‡10.0
Lake Charles	17.50	18.00	8.5	‡12.0
Shreveport	17.00	17.0	8.5	‡9.0
Knoxville, Tenn.	20.00	20.50	8.5	12.5
Memphis	17.25	17.75	8.5	10.5
Chattanooga	19.00	19.5	8.5	11.0
Nashville	19.00	19.5	8.5	10.0
Bristol	18.25	18.75	8.5	12.0

Esso at dealer price less 0.5 cent per gallon to undivided dealers.

‡Includes 1-cent state tax.

Price basis to commercial consumers throughout Louisiana, Arkansas, and Tennessee: On single deliveries of 50 gal. or more at a time—posted consumer tank-wagon price. On single deliveries of less than 50 gal. at a time—posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price is the same as the posted dealer tank-wagon price, less 0.5 cent per gallon.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Comm. tank wag.	Gasoline Dir.* tank wag.	Gasoline Inc. tax	Kero. tank wag.
Albany	14.2	14.7	5.5	7.7
Met. New York	14.4	14.9	5.5	8.0
Buffalo	14.5	15.0	5.5	8.3
Rochester	15.1	15.6	5.5	8.8
Syracuse	14.8	15.3	5.5	8.7
Portland, Me.	14.6	15.1	5.5	8.1
Manchester, N. H.	15.6	16.1	5.5	9.0
Burlington, Vt.	15.2	15.7	5.5	8.3
Boston, Mass	13.2	13.7	4.5	8.0
Worcester	13.8	14.3	4.5	8.1
Hartford, Conn.	13.9	14.4	4.5	7.6
New Haven	13.3	13.8	4.5	6.9
Providence, R. I.	13.3	13.8	4.5	7.8

*Undivided.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank wag.	Gasoline Dir.	Gasoline tax	Kero. Incl. tank wag.
Omaha	17.9	15.4	6.5	9.3
McCook	18.5	15.9	6.5	9.5
Norfolk	18.4	16.9	6.5	10.3
North Platte	18.8	16.4	6.5	10.7
Scottsbluff	18.9	16.0	6.5	9.5

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Incl. tax	Kero. tank wag.
Dallas, Tex.	14.0	17.0	5.5	7.0
Fort Worth	14.0	17.0	5.5	7.0
Houston	14.0	18.0	5.5	8.0
San Antonio	14.0	18.0	5.5	7.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Gasoline Tank wag.	Gasoline Incl. tax	Kero. tank wag.
Halifax, N. S.	29.5	13.0	19.0
St. John, N. B.	29.5	13.0	19.0
Montreal, Que.	28.0	11.0	17.5
Toronto, Ont.	28.5	11.0	18.0
Hamilton, Ont.	28.5	11.0	18.0
Winnipeg, Man.	30.5	10.0	22.5
Brandon, Man.	31.0	10.0	23.0
Regina, Sask.	28.0	10.0	20.0
Saskatoon, Sask	30.8	10.0	22.8
Edmonton, Alta.	28.9	10.0	20.9
Calgary, Alta.	26.0	10.0	18.0
Vancouver, B. C.	25.0	10.0	24.0

Selected Crude Prices

Sinclair Prairie Oil Marketing Co. rescinded its upward price adjustment of 7 cents per barrel in North Texas, effective November 11. The advance was made November 6. Other purchasers in the district reduced their schedules of prices November 11, 12 and 13, returning to the top posting of $1.18 per barrel of 40° gravity crude in that district.

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	2.75

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill Calif.	Okla. homa, Kansas	Gulf Coast, Texas	West Texas, Lea County N. M.
18-18.9	$0.80	...		
19-19.9	.84		$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	...	1.07	1.30	.94
32-32.9	...	1.09	1.32	.96
33-33.9	...	1.11	1.34	.98
34-34.9	...	1.13	1.36	1.00
35-35.9	...	1.15	1.38	1.02
36-36.9	...	1.17	1.40	1.04
37-37.9	...	1.19	1.42	1.06
38-38.9	...	1.21	1.44	1.08
39-39.9	...	1.23	1.46	1.10
40 and above	...	1.25	1.48	1.12

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of November 18, 1941

(Most prices in cents per gallon)

The quotations are exclusice of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055
60-62 400 grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06125
63-66 octane	.0550	.06
60 octane and below	.05125	.05375
60-62 400	.05	.06

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06125
63-66 octane	.0550	.05875
60 octane and below	.05	.06

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06125
60 octane and below	.05	.05375

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055
60-62 400 grades:		
72-74 octane (regular)	.06	.0625
63-66 octane	.05625	.05875
60 octane and below	.0525	.055

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)	.0750	.0775
80 octane (1939 Research)		.0800

CALIFORNIA (domestic movement)—

58-60 400, 65 oct. and higher	.065	.0725
54-58 U. S. Motor	.0575	.0625

EAST COAST (domestic)—

U. S. Motor (minimum 72 octane):		
New York (Bayonne)*	.08	.085
Philadelphia	.08	.0825
Boston	.085	.09
Baltimore	.08	.0825
Charleston, S. C.	.0725	.0775

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
80 plus (research)	.06625	.0675
72-74 octane (leaded)	.0625	.06375
70-72 octane (unleaded)	.0625	.0650
68-70 octane (unleaded)	.0625	.0650

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.05125
Grade 18-55	.06125	.0625

NORTH TEXAS—

Grade 26-70		.0475
Grade 18-55	.05625	.0575

CALIFORNIA—

75-85 375-390	.045	.05

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.0475

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p. 110-flash, 540-550 e.p.	.0375	.03875
41-43 gr., 300-320 i.b.p. 110-125 flash, 500-520 e.p.	.03875	.04
46-48 gr., 210-230 i.b.p. 480 max., e.p.	.04125	.0425

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.0450	.0475
41-43	.04375	.04625

NORTH TEXAS—

41-43	.0425	.04625

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04375	.04625

ARKANSAS (Ark. and N. La. del.)—

41-43	.04375	.04625

PENNSYLVANIA (inland refineries)—

46	.0625	.06625
45	.0625	.065

CHICAGO (Based on Group 3)—

42-44	.0450	.0475
41-43	.04375	.04625

CALIFORNIA (Pac. Coast market)—

38-40 high-burning test	.045	.055

NEW YORK (Bayonne, N. J.)—

41-43		.055

GULF COAST (domestic)*—

41-43	.04	.04125

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.04	.0425
No. 1 white (38-42)	.03875	.04125
No. 2 straw (32-36)	.03625	.03875
No. 3 zero to 10 (28-32)	.035	.0375

NORTH TEXAS—

No. 1 white (38-42)	.03825	.04125

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2 (32-36)	.0325	.035

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.0325	.035

CHICAGO (Based on Group 3)—

Range oil	.04	.0425
No. 1 white (38-42)	.03875	.04125
No. 2 straw (32-36)	.03625	.03875
No. 3 zero to 10 (28-32)	.035	.0375

NEW YORK (Bayonne, N. J.)—

*No. 1		.055
*No. 2	.051	.0525
*No. 3	.051	.0525

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

No. 5, low pour point (18-22)	.85	.90
No. 6, 15 and above (10-16)	.85	.90

NORTH TEXAS—

No. 5, low pour point (18-22)	.80	.85
No. 6, 15 and above (10-16)	.80	.85

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.80	.85

CHICAGO (Based on Group 3)—

No. 5, low pour point (18-22)	.85	.90
No. 5, 15 and above (18-22)	.85	.90
No. 6, low pour point (10-16)	.85	.90
No. 6, 15 and above (10-16)	.85	.90

PENNSYLVANIA (inland refineries)—

36-40	.055	.06

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.75	.85
10-16 (cargo lots)	.75	.85
12-17 (tank cars)	.65	.75
10-17 (high sulfur)	.55	.65
San Joaquin Valley:		
10-18 (tank cars)	.70	.85
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.80	.85

GULF COAST—

No. 2 fuel		.04
43-47 diesel		.04125
48-52 diesel	.04125	.0425
53-57 diesel		.0425
58-and-above diesel	.0425	.04375
Diesel bunkers		1.45
Bunker C (bulk cargoes)	.85	.90
Bunker C (bunkers)	.85	.90

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.050
28-30 diesel (lighterage 6¼c per bbl.)		2.15
28-30 diesel (tank cars)		.05
Bunker C (to ocean-going ships in N. Y. Harbor)	1.35	1.45
Industrial fuel (tank cars)		.044

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.27
150-160 D, 0-10		.23
150-160 D, 10-25		.225
120-125 D, 0-10		.225
120-125 D, 10-25		.22
Steam refined:		
600 dark green (untreated)		.145

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.305
15 pour point		.295
25 pour point	.25	.28
Steam refined:		
600	.15	.16
650	.155	.165
600 flash	.16	.18
630 flash	.17	.185

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.145
180-3		.15
200-3		.15
250-3		.165
280-3		.175
280-4		.17
300-3		.185
350-3½		.19
400-3½		.20
500-3½		.205
600-3½		.21
100-2½ paraffin oil 10-25		.0825
10-25 pour point:		
200-3		.145
250-3		.16
280-3		.17
280-4		.165

CALIFORNIA (moving to dom. mkt.)—

Pale oils:		
200-2½-3	.07	.0775
300-2½-3	.07	.0775
400-3-4	.0725	.08
450-3-4	.0725	.08
550-3-4	.0875	.1075
600-3-4	.0875	.11
Red oils:		
200-4-5	.07	.0775
300-5-6	.0725	.08
350-5-6	.09	.11
400-5-6	.09	.11
450-5-6	.09	.1125
500-5-6	.0925	.1125
600-5-6½	.0925	.1125
700-6½ plus	.0925	.1125
750-6½ plus	.0925	.1125
900-6½ plus	.0925	.1125

GULF COAST—

Pale oils:		
100-3	.0625	.0650
200-3	.0850	.0875
300-3	.09	.0925
500-3½	.0975	.10
750-3½	.10	.1025
1,200-3½	.1025	.10375
2,000-4	.1050	.1075
3,000-4	.1225	.1250

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		.385
10 pour point		.375
15 pour point		.365
25 pour point		.31
200 vis., at 70° F., 3 color:		
Zero pour point		.405
10 pour point		.395
15 pour point		.385
25 pour point		.33

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.06	.06125

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale		.0625
124-126 (A.m.p.) w.c. scale		.0625

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax	.0560	.0640
128-130 (A.m.p.) wax	.0560	.0660
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.		.0625
124-126 (A.m.p.) y.s.		.0625
Petrolatum in barrels, carload lots:		
Dark green		.02875
Amber	.02875	.03125
Extra amber	.03125	.03375
Lily white	.04875	.05375
Snow white	.05625	.05750
Cream	.04125	.05250

Export Prices

GASOLINE

GULF COAST—

60-62 400	.0550	.0675
61-63 390	.0575	.0650
64-66 375	.0575	.0650

LOS ANGELES—

U. S. Motor grades:		
Above 60 octane	.06	.0625
65-69 octane	.0575	.06
60-65 octane	.0525	.055

KEROSENE

GULF COAST—

41-43 water white	.0375	.04

LOS ANGELES—

41-43 water white	.05	.0525

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbl.)—

Cylinder stocks:		
600 S. R. unfiltered		.265
630 S.R. unfiltered		.27
600 flash, S.R.		.265
650 flash, S.R.		.27
Bright stock:		
Light, 25 pour point	.36	.37

NEUTRAL OIL

200-3 color	.43	.50
150-3 color	.41	.46

PARAFFIN WAX

NEW YORK (prices per bbl.)—

123-125 A.m.p.	.0560	.0625
125-127 A.m.p.	.0560	.0625
128-130 A.m.p.	.0585	.0650
133-135 A.m.p.	.0615	.0700
135-137 A.m.p.	.0640	.0700
Crude scale:		
124-126 w.s.		.0625
124-126 y.s.		.0625

EQUIPMENT PROGRESS...

Crane Announces Bellows-Type Water Pump Seal

In announcing this new bellows-type seal, the Crane Packing Co., 1800 Cuyler Avenue, Chicago, manufac-

turers of John Crane seals for more than a quarter century, list the following as principal features:

1. Seal has only two parts: bellows and spring. Bellows is an exclusive synthetic rubber compound found to be superior to any other for sealing services; grease, oils, salt water, alcohols and antifreeze do not affect it.

2. Installed partially compressed; ready for instant seal.

3. Entire unit (bellows and spring) is spring-driven and operates as a driving coupling. Seal does not touch or have a sliding contact with the shaft; rust, corrosion and deposit do not interfere with or reduce efficiency.

4. Bellows connects two flanged ends. Spring is placed in a fixed position against the inside shoulders of the flanged ends and so holds the contact facings against the sealing washer on the one end and the driving base on the other.

5. Because of the seal's ability to flex and compress as a unit, pressure variation, misalignment, fan thrust, torque or vibration set up by an unbalanced impeller, are automatically accommodated or compensated for.

6. The serrated contact facings are responsible for the positive seal at both the washer and driving base points. These facings are formed in a series of concentric grooves and flat-faced ribs, effecting seal with a suction action.

7. Among other advantages is "blindfold" installation. Seal cannot be installed wrong either on the assembly line or in the field. Both ends are identical—either end is right.

Samples and data furnished on request to automotive and industrial pump engineers and designers.

Le Roi Company Observes Twenty-fifth Anniversary

In October, Le Roi Co. Milwaukee, Wis., completed 25 years in business. The company, which began its existence in a small shop on the site of the present main building, has now grown to consist of three plants all located in Milwaukee. Le Roi manufactures engines of 4 to 400 hp., portable air compressors of 60 to 420 c.f.m., and engine-generator sets of 2 to 200 kw.

Highlights in the history of the company include the introduction by Le Roi, in 1920, of the first multiple-cylinder industrial unit to be used on construction machinery; the development of a very dependable series of oil-field pumping and drilling engines and in particular a 12-cylinder, 350-hp. engine for very deep drilling; and, during the past year, the awarding to Le Roi by the U. S. Army of the largest portable air-compressor orders.

C. W. Pendock has been president and J. R. Frantz has been vice president of the company since its inception.

Tulsa Nomads Endorse Plans For Petroleum Exposition

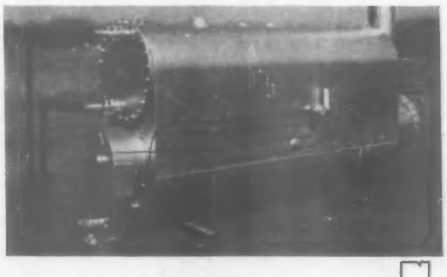
Members of the Tulsa chapter of Nomads at their monthly luncheon Monday, November 17, endorsed the plans to hold the International Petroleum Exposition in Tulsa, May 16-23. In the discussion that preceded the action, several members of the organization who plan to have exhibits said the exposition would serve a constructive end in making available to the industry the latest developments in petroleum technology including the substitutes made necessary by defense preparations.

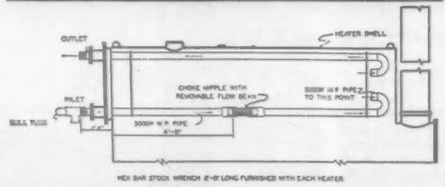
Fred E. Cooper of the Fred E. Cooper Co. and Paul Hedrick, oil editor of the Tulsa World, spoke at the lunch reviewing developments at the recent A.P.I. meeting in San Francisco.

New B.S.&B. Indirect Heater Prevents Hydrate Freezeups

For heating high-pressure gas or high-pressure gas-oil mixtures, a safe water-bath type of flow-line heater has been developed by Black, Sivalls & Bryson, Inc., box is installed in the lower part of the heater shell. A Oklahoma City, Okla. A welded horizontal tubular fire-removable fluid tube bundle constructed from pipes is bolted in place above the horizontal firebox. Before operation is started, the entire shell is completely filled with water.

Features claimed by the manufacturer are: (1) Safety: Indirect method of heating keeps inflammable fluid farthest from direct flame. Heating is even without excessively high local temperatures. (2) No heater firebox burnouts: The fresh water surrounding the firebox is noncorrosive and does not contain sufficient depositable hardness to cause scale to form on the firebox. (3) No caked-up flow tubes: The low, even water-bath temperature minimizes scale or lime deposits. (4) Special built-in submerged choke eliminates choke freezing due to hydrates and allows medium-pressure inexpensive flow-tube bundle to be used. (5) Special corrosion-resistant flow-tube bundles can be used for handling sulphur-laden, corrosive oil or gas.

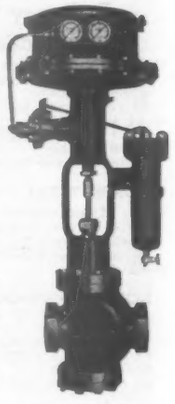




B.S.&B. indirect heater. Diagram shows positive choke for high-pressure indirect heater operation

Fisher Governor Has New Series of Regulators

Fisher Governor Co., Marshalltown, Iowa, has announced a new series of time-cycle regulators for cycle control on gas-lift systems. Low gas-oil ratios, increased production, and low operating costs are a few of the results obtained with this production method.



The intermitter-pilot assembly of the new B series incorporates a new universal cam assembly consisting of two chromium-plated clock wheels, each furnished with a set of eight lugs. The lugs are easily set to obtain any desired timing intervals; individual intervals may be readily changed; or all intervals may be lengthened or shortened simultaneously by simply rotating one of the wheels with relation to the other. Thus, complete flexibility in timing of desired on-and-off periods is readily available.

In addition to greater flexibility, the series B cam assembly offers greater dependability and longer life because of greater strength in construction and design. Clocks are finest instrument-type construction—absolutely dependable. All pilot parts are fully protected by the weatherproof, gas-tight case with gasket sealed hinged cover.

Another feature of these new Fisher intermitters is the integral mounting of the auxiliary operating medium regulator and filter. The controller is shipped completely assembled with all copper tubing connections made. (See illustration.) This feature greatly simplifies installations in the field. Where desired the intermitter can be furnished with the regulator and filter unmounted, but connected to the pilot case with iron pipe. Diaphragm valves are standard Fisher construction, either push down to open or push down to close. They are particularly designed for pilot controls. Fisher Bulletin 80 D, just off the press, gives full details and specifications.

Research Develops Fluid And Pumpable Cement

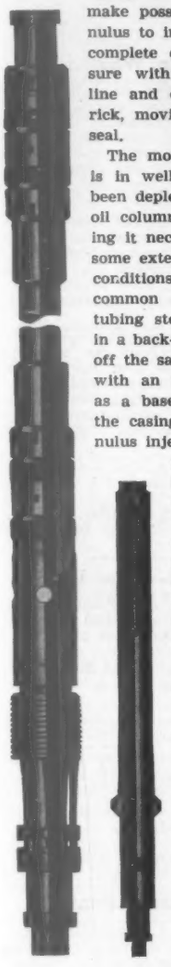
Oil men have pointed out that for successful cementing, an oil-well cement should remain fluid and pumpable for extended periods under different hole temperatures and pressures. It was to meet this severe requirement, says an announcement by Universal Atlas Cement Co., that Unaflo, the cement with a retarded set, was developed 6 years ago. That cement is being constantly improved by research in the field, laboratory, and plant.

Slow-setting cement stiffens like ordinary cement but at a slower rate. Unaflo cement has a delayed or retarded set. Thus it does not congeal but remains fluid and pumpable for the entire period of retardation, after which it hardens normally. It does not stiffen or jell, but remains fluid under different hole temperatures and pressures all during the period required for pumping, including unforeseen delays and shutdowns for extended periods.

Despite the satisfaction that Unaflo retarded cement gave upon its introduction 6 years ago, and the 2,100 per cent increase in its use since then, the Universal Atlas Cement Co. was not satisfied. Its research engineers continued their studies. As a result of this continuing research the product has been further improved to provide more uniform field performance and even better safeguard for all kinds of cementing and recementing jobs.

Otis Tubing Perforator and Packoff Anchor Used for Kickoff

The Otis wire line tubing perforator service and packoff anchor provide a means to remove mud or water from back of a casing packer without contaminating or exposing the lower pay and make possible the use of the casing annulus to inject gas to flow the well. The complete operation is made under pressure with an ordinary steel measuring line and does not require erecting derrick, moving tubing, or breaking packer seal.



The most common usage for this tool is in wells where the gas pressure has been depleted to such an extent that the oil column loads up in the tubing, making it necessary to kickoff the well with some external source of gas. Where such conditions exist, it has become a very common operation to set a removable tubing stop just above the packer, drop in a back-pressure valve to keep the mud off the sand face, cut holes in the tubing with an Otis perforator, using the stop as a base, circulate all the mud out of the casing annulus, and through the annulus inject gas to kick off the well. The packoff anchor is run to regulate the gas entering the tubing through the perforations.

The wire-line tubing perforator consists of a wedge, two knives, and a knife base. The taper of the tapered wedge is sufficiently small to cause the impacts from an ordinary set of tubing jars to force the two knives through the tubing walls. The knives retract with an upward pull on the line, permitting the tools to be easily removed.

The packoff anchor consists of two parts, a packoff section and the tubing stop. The purpose of the packoff section is to control the flow through the tubing perforations, whereas the tubing stop serves two purposes; first, as a stop and base for the perforating job, and secondly, as an anchor and guide for the packoff section. The removable tubing stop is simply a tapered mandrel on which are mounted three slips held together by a slip carrier. The slips point downward and utilize all downward forces and impacts to further secure the lock. The stop is run and pulled with a Type H Otis running tool.

The packoff section consists of two sealing-cup assemblies connected by a spacer nipple. The tool is designed so that when it sets down on the stop one cup assembly is above and the other below the tubing perforations. This restricts all flow through the perforations to that which will pass through the orifice between the cup assemblies. The packoff section is run with an Otis Type H running tool and pulled with an Otis choke extractor.

TRADE LITERATURE

LaPLANT-CHOATE MANUFACTURING CO., INC., Cedar Rapids, Iowa.—A 16-page booklet telling the history and development of the LaPlant-Choate CW-10 Carrimor scraper and describing the many design features, the bowl, hydraulic system, wheels, and brakes. Included also is a section on the TW-10 Carrimor scraper which is the same machine with front-wheel assembly for use with track-type Caterpillar tractors.

REED ROLLER BIT CO., Houston, Tex.—Bulletin T-1041, giving valuable pointers on the care and maintenance of tool joints. It explains that a string of perfect tool joints can be ruined by not exercising reasonable care in their handling.

W. H. NICHOLSON & CO., Wilkes-Barre, Pa.—Bulletin 1041, a supplement to Bulletin 439, describes a new addition to the Nicholson line of industrial steam traps.

AMONG EQUIPMENT MEN...

Research Head Named By Foote Brothers

Wallace F. Ardussi has been placed in charge of research and product development for Foote Brothers Gear & Machine Corp. it was announced recently by W. A. Barr, president and general manager.

WALLACE F. ARDUSSI

Mr. Ardussi has been associated with the automotive industry since his graduation in 1928 from the engineering college of the University of Michigan.

He enters the Foote Bros. organization with a background of 10 years' engineering experience with Chrysler Corp. where he progressed through the positions of research and development engineer, manufacturing and production research engineer, assistant to the president of Chrysler Corp., and sales manager of the Airtemp division of Chrysler.

Three Associates Purchase Stock of Geophysical Service

Eugene McDermott, president of Geophysical Service, Inc., announces the purchase of all the company's capital stock by himself and three associates, H. B. Peacock of Houston, Tex., Cecil H. Green of Dallas, Tex., and J. E. Jonsson, also of Dallas.

Geophysical Service, Inc., has been engaged in geophysical exploration work in the United States and in countries all over the world for many years. It has an enviable record and is credited with finding more than 150 new oil fields. Its home office and research laboratories are located in Dallas, Tex., and a branch office is located in Houston, Tex., and in Tulsa.

Management of the company will be continued under the leadership of Eugene McDermott as president, with Messrs. Peacock and Green serving as vice president. Mr. Jonsson is secretary and treasurer.

Jackson Heads New Lane-Wells Office at Dallas

Lane-Wells Co. has recently opened an office at 714 Gulf States Building, Dallas, Tex., under the supervision of Warren J. Jackson. The new branch office will permit a closer tie-in between the Shreveport and Odessa districts and will provide better sales and service contacts with its many customers in Dallas and Fort Worth. The office will also facilitate communication between the Mid-Continent and Gulf Coast divisions.

Jackson joined the Lane-Wells organization March 10, 1941, being first assigned to the post of district sales engineer in the Houston district. In this capacity it was possible to augment his knowledge of those production practices involving Lane-Wells service with special emphasis on direct aapplication and sale of these services.

Assistant Chief Engineer Appointed by Kellogg

Robert M. Kalb, who for 13 years was research engineer of the Bell Telephone laboratory of New York, has just been appointed assistant chief engineer of the Kellogg Switchboard & Supply Co., of Chicago, Ill.

Mr. Kalb is a graduate of Ohio State University, department of electrical engineering, and took post-graduate work at Columbia University. After graduation he taught in the electrical engineering laboratory at Ohio State University. He is well known for his research engineering work on transmission and circuit problems. Several patents have been issued to him for improvements on various telephone apparatus. He is also the author of valuable articles on magnetics.

Process Division Head of Babcock & Wilcox Moved

W. J. Thomas, who has spent 9 years with the process equipment division of the Babcock & Wilcox Co. at Barberton, Ohio, has now been transferred to the executive department of the sales offices of the Babcock & Wilcox Tube Co. at Beaver Falls, Pa.

Prior to coming with the Babcock & Wilcox Co., Mr. Thomas was associated with the Petroleum Iron Works at Sharon, Pa., as assistant manager of sales. He is a graduate of Carnegie Institute of Technology, class of 1922.

Wickwire Spencer Names New Credit Manager

C. W. Moore has been made general credit manager of the Wickwire Spencer Steel Co., 500 Fifth Avenue, New York, N. Y. Simultaneously W. H. Carlson has been made assistant credit manager.

Mr. Moore was born in Louisville, Ky., in 1893. He first joined Wickwire Spencer in 1930, serving in the credit department of the company's Tulsa office. In December 1931, he was transferred to Worcester, Mass., where he remained until 1936, at which time he was appointed Pacific Coast credit manager, which position he has held until now.

Mr. Moore and Mr. Carlson will be located in the company's Worcester, Mass., office, 80 Webster Street.

J. H. Watters Made President Of Union Asbestos

J. H. Watters on November 1 became president of Union Asbestos & Rubber Co., succeeding L. L. Cohen, who was elected chairman of the board of directors. Mr. Watters was formerly general manager of the Marion Steam Shovel Co., Marion, Ohio.

J. H. WATTERS

Born in Norfolk, Va., January 30, 1885, Mr. Watters attended Norfolk High School and the University of Virginia. He started his business career with Watters & Martin Hardware Co., Norfolk, in 1905 and was with them continuously until December 31, 1925. On January 1, 1926, Mr. Watters became vice president and manager of sales of the New York Air Brake Co. and remained there until October 31, 1929. He then became president and general manager of the Marion Steam Shovel Co.

Pipe Division Sales Head Appointed by Republic

The appointment of Manly B. Brown as manager of sales, pipe division, Republic Steel Corp., has been announced by W. J. Clarke, vice president in charge of sales. Mr. Brown has been with Republic since December 1936 as assistant manager of sales, pipe division.

Mr. Brown was formerly associated with the Wilson & Bennett Manufacturing Co. as eastern sales manager, and prior to that was Chicago representative of the Ohio Corrguating Co. For 8 years he was in the Chicago sales department of the Wheeling Steel Corp. During the first World War he spent 2 years in France.

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20 Years Experience
Inquiries Invited
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For Sale: Many Producing Oil Properties, Royalties, Drilling Blocks, and Oil Investments of various sizes in Mid-Continent area. Contact us to Buy or Sell properties.
Alexander Bldg., Tulsa, Okla.

FOR SALE

One-half interest in desirable producing property in dolomite area of the Panhandle, Hutchinson County Texas. Well equipped and operated lease with 27 wells on 320 acres, all productive. Present owner in liquidation solicits inquiry from responsible brokers and operators interested in purchase of production on cash basis. Address

BOX A-680
The Oil and Gas Journal
Tulsa, Okla.

FOR SALE Oil and gas leases, small production, Fluorspar and Rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Kentucky.

HAVE Oil Company, Inc., would like a partner to operate in Kansas who knows how to promote wells and Broker Leases and Royalties. Box A-733, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: 80 acre lease, three wells producing 8 bbls. per day. Locations for ten more wells. 600 feet deep, 30 feet of sand. All equipment in good condition. Snap if taken quick. Write H. B. Snyder, Box 126, Ottawa, Kans.

LEASE for Oil or Trapping the SW ¼ of Sec. 15, Tp. 16s, R. 15, Plaquemines Parish, La. Owner, J. Manz. R F D, Goddard, Kan.

BLOCK of leases in Southwestern Oklahoma. Open for deal with parties able to drill well for acreage. Good geology. Write Philo Dempsey, Roosevelt, Okla.

FOR SALE: Oil lease, 80 acres, S½ of SW¼ Sec. 15-34-13, Chautauqua Co., Kans. 14 wells, good power and tanks, depth 700 ft., 32 ft. Peru sand, present production about 4 bbls. With small expenditure production can be raised to 12 bbl. Install water flood results would be highly profitable. Price $7500.00 cash. If interested come and inspect lease. I will not answer correspondence. M. J. REGAN, Coffeyville, Kans.

WANT TO BUY some shallow oil production, pipe line connection. Give full particulars in first letter. Box A-754, The Oil and Gas Journal, Tulsa, Okla.

Leases and Drilling Blocks

EAST TEXAS Woodbine-Trinity sand wildcats starting. If you have some money and will exercise little common sense and judgment chance you might pick up 10 to 50 for one. E. CROFT, PROCTOR, TEX.

I WANT to contact someone in the oil business or who wants to get in the oil business, who will furnish me with two strings of casing to help me complete a wildcat on the best looking structure in New Mexico. Will need about 1600 feet of 10 inch and 2100 feet of 8 inch to get down to the top of the salt. My well is being drilled on the Kenna Dome in Roosevelt county, New Mexico—is now down 1243 feet and has 954 feet of 12 inch in the hole. I want this casing on a "lend-lease" basis; if we win, on the deal I'll give you—you'll make a fortune; if we get a dry hole, you can pull your casing, or I'll pull it for you, and if present conditions keep up, you can probably sell it for more money than you paid for it. I have the best Standard drilling rig on this job now, and am all ready to go as soon as I deal for the casing. You would probably have to put out about $7,500.00 to buy this casing and I don't see where you could lose a dime. Get in touch with me at once and if you have the money, I'll make you a deal. I'm rarin' to go as soon as I get this casing and I believe I'll bring in a new oil field. Here's a chance for some man or woman who wants to get a start in the oil business. Write at once to

C. S. PETERSON
1629 N. Fairfax Avenue,
Hollywood, California.

I KNOW acreage in Western Kans. on good Geology. Open for development. Can furnish drilling Block to Parties who mean Business. Also have for sale interest in acreage to be drilled soon offsetting Production; and some good Royalties. Can furnish satisfactory references. H. R. OWENS, Utica, Kans.

OIL LEASE: Have 125 acres Woodson County, Kansas, oil lease. 80 acres will produce—field bounded. Three producing gas wells in Bartlesville at 1162. Top of Mississippi Lime at 1200', oil at 1205'. I drilled into this strata and produced oil. Have drilling machine on lease, tubing, casing, oil tanks, gun barrel, etc. If you can match up my investment you can have 50%. Write for full details. E. B. Jaeger, 3702 W. 3rd St., Los Angeles, Calif.

FOR LEASE in Yoakum County, Texas. 40, 80, or 160 acres close to production; SE¼ of Section 822, Blk. D; John H. Gibson survey. C. C. Beebe, Route 2, Box 134-A, Okmulgee, Okla., or Paul R. Beebe, Bennett, New Mexico.

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Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

Situations Wanted

REFINERY ENGINEER with practical, technical, and operating knowledge desires responsible job with operating company. Box A-710, The Oil and Gas Journal, Tulsa, Okla.

REFINERY ENGINEER AND TECHNOLOGIST with fifteen years' experience, B.S. degree, age 36. Experience covers design of crude and cracking plants, design, construction and operation of vacuum lube plants, tubular heaters, pilot distillation and solvent treating units, also patent work and cost engineering. Box A-740, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

DESIGNERS for oil refinery piping, also structural and concrete. Must be thoroughly experienced this class of work. State fully first letter salary desired, complete detail of your experience, age and when services available. Arthur G. McKee & Company, 2300 Chester Avenue, Cleveland, Ohio.

GRADUATE engineer with oil tool design experience. Some field experience. Capable of working with shop, sales, and accounting departments. Will be in charge of drafting room. State draft status. Box A-744, The Oil and Gas Journal, Tulsa, Okla.

GOOD salaried position open with responsible oil company for expert male stenographer who also has oil experience and ability in purchasing and selling leases and handling drilling blocks. Must have good acquaintance among industry. Apply P.O. Box 1583, Ft. Worth, Texas.

PURCHASING AGENT—Midwest Chain Operator wants Purchasing Agent—Heating Oils — Motor Oils — Gasolines — For Highway — Water and Rail Terminal Facilities. Box A-751, The Oil and Gas Journal, Tulsa, Okla.

Ranches—Farm Lands

7000 acre ranch eastern Colo., well watered good grass, $4.50 per acre.
1600 acre ranch, $3.50 per acre, will consider lease for oil.
480 acres nice farm land in best Stevens Co., Kans., gas area, $6000. $1200 will handle.

Write Guy Speakman,
Liberal, Kans.

WESTERN Ranches—500,000 acres, or smaller. State where wanted. No lists. Howard Ingram, Perrine Bldg., Okla. City.

BUY RANCH LAND under oil development. Leased for drilling, returns ⅛ royalty. 20 acres $135 or 40 acres $250. Full details furnished. Write Box A-734, The Oil and Gas Journal, Tulsa, Okla.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Business Opportunity

SMALL Refinery in Kentucky — Good opportunity, fine location. Write Ewell Harlon, 1110 Larchmont, Louisville, Ky.

A LUBRICATING Oil and Grease business made 40% on selling price first nine months this year; will take $50,000 cash to handle. No debts. 10 year established business. Box A-742, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE OR TRADE—One Refinery in the heart of Kansas oil field. Trade for Ranch or sell for cash. Box A-753, The Oil and Gas Journal, Tulsa, Okla.

Real Estate

LOVELY, modern Austin home with beautiful lawn offered at great sacrifice to settle Estate. No trade. Edwin McKellar, Austin, Texas.

Stocks and Bonds

OFFER controlling interest in extra good, large city, personal loan bank; investment around $40,000.00 to $70,000.00. No brokers. Box A-752, The Oil and Gas Journal, Tulsa, Oklahoma.

Equipment Wanted

WANTED good used 4, 6, 8, 10 and 12 inch pipe, plain or coupled. Write Daniel A. Moritz Co., McKeesport, Pa.

HIGHEST cash prices paid for entire plants or individual production tools, milling machines, shapers, drill-presses, lathes, punch presses, electrical equipment and motors. Write us and a representative will call. COOK COUNTY MACHINERY CO., 1132 W. Lake St., Chicago, Ill.

WANTED — Gardner Denver Portable Verticle Vacuum Pumps. Describe fully, condition, lowest cash price. P. O. Box 483, Shreveport, La.

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4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

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This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

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Tulsa, Oklahoma